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PITTSBURGH WHOLESALE FOOD DISTRIBUTION FACILITIES



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U.S. Department of Agriculture
Agricultural Research Service

Marketing Research Report No. 660

Preface and Acknowledgments

This study of wholesale marketing facilities for food in the Pittsburgh area is part of a broad program of research by the Agricultural Research Service, U.S. Department of Agriculture, to improve efficiency in moving food from farmers to consumers. Specifically, this study ascertains the adequacy and costs of existing wholesale food marketing facilities and handling methods in the distribution area served by Pittsburgh. The number, types, arrangement, and costs of facilities and operations required to improve the distribution of foods are also determined.

The six commodity groups studied by the U.S. Department of Agriculture (USDA) were fresh fruits and vegetables, meat and meat products, processed poultry, groceries, manufactured dairy products and eggs, and frozen foods. The Pennsylvania Department of Agriculture studied wholesale marketing of florist products and cooperated with the U.S. Department of the Interior in a study of wholesale marketing facilities for fishery products.

A series of presentations of this report's highlights were made at public meetings in June 1962. Since that date, extensive use of the data has been made by planning groups in the Greater Pittsburgh area.

The authors are grateful to the firms associated with the wholesale food business in the Greater Pittsburgh area—including the wholesalers in each of the aforementioned commodity groups, food-chain executives, the Pennsylvania Railroad and the Baltimore & Ohio Railroad, city and county officials (particularly, the planning departments), local union officials associated with the wholesale food trade, the U.S. Army Corps of Engineers (Pittsburgh area), and the Regional Industrial Development Corporation—for their help.

The following rendered valuable assistance in their particular field: John T. Mauro, Urban Renewal Coordinator, Mayor's Office; Frank McChesney, formerly Associate Director, City Planning Department; Carl H. Pieper, Vice President, Pennsylvania Packers Association (Meat); A. P. Rightor, Vice President, Terminal Division, United Fresh Fruit & Vegetable Association; L. V. Rubright, Regional Marketing Agent (Pittsburgh), Agricultural Extension Service (Pennsylvania); Fred H. Siger, Director (formerly President), Pittsburgh Branch of United Fresh Fruit & Vegetable Association; Edward E. Smuts, Economic and Urban Development Consultant.

Charles Glenn, Chief Agricultural Economist of Midwest Research Institute, directed the collection and analysis of basic data showing volume, flow, and handling costs. This work was accomplished as specified in a contract between the USDA and the Midwest Research Institute.

The experience of the late H. G. Clowes, the original project supervisor, in previous marketing facilities studies and his knowledge of the food industry in Pittsburgh, his former home, were valuable assets. Delay in publication of this report resulted from his untimely death.

This study was conducted under the general supervision of William C. Crow, Director, Transportation and Facilities Research Division, Agricultural Research Service (ARS). R. L. Holland and E. G. Taylor, authors of similar reports by this Division, assisted in the organization of this report. J. N. Morris, Jr., an industrial engineer, assisted in the revisions. Other division staff assistance is appropriately footnoted throughout the text.

Contents

	Page		Page
Summary.....	ii	Streets and parking areas.....	41
Background of the study.....	1	Service facilities and allied industries.....	43
THE PRESENT WHOLESALE FOOD MARKETING SYSTEM		Facilities arrangement and acreage required for the proposed center.....	43
Description of the facilities in the Pittsburgh area.....	3	A recommended site arrangement.....	44
Strip area.....	3	Layout of other possible sites.....	44
North side.....	6	Stages of development.....	44
South side.....	6	Acreage required.....	48
Other areas.....	7	Selecting a site for the proposed center.....	48
Tenure and operating space of facilities.....	8	Convenience to retail outlets.....	48
Volume and movement of food through the facilities.....	8	Direction of population growth.....	48
All commodities.....	10	Adequate land at reasonable cost.....	48
Fresh fruits and vegetables.....	12	Accessibility to truck transportation.....	49
Meat and meat products.....	13	Accessibility to rail transportation.....	50
Processed poultry.....	14	Accessibility to public utilities.....	50
Groceries.....	14	Avoidance of nonmarket traffic.....	50
Manufactured dairy products and eggs.....	16	Land use, topography, shape of tract, and zoning.....	50
Frozen foods.....	19	Sites evaluated.....	50
Fishery products.....	19	Estimated investment in land, facilities, and organization.....	52
Flowers.....	19	Land.....	52
Center of distribution.....	21	Facilities.....	53
Selected costs affected by present facilities and movement.....	21	Organizational fund.....	53
Cost from first point of arrival to wholesale facilities.....	21	Investment costs.....	53
Costs of handling within the market area.....	22	Summary of investment costs.....	56
Rent, spoilage, and associated costs within the market area.....	22	Financing and ownership of the proposed center.....	56
Costs of distribution from the market area.....	23	Private corporation.....	56
Summary of selected marketing costs.....	24	Public benefit corporations.....	56
Nonmeasurable costs.....	24	Direct public ownership.....	57
Inadequacies in the marketing system.....	25	Cooperative associations.....	57
Inadequate buildings.....	25	Combinations of methods.....	58
Lack of flexibility in receiving.....	25	Estimated annual revenue required.....	59
Traffic congestion.....	25	Debt service.....	60
Lack of centralized marketing facilities.....	27	Real estate taxes.....	61
Poor working conditions.....	27	Management and maintenance costs.....	61
Unnecessary waste and spoilage.....	28	Summary of annual revenue required.....	62
Lack of a coordinating authority.....	28	Sources of annual income.....	64
Difficulties in price making.....	29	Measurable benefits and marketing cost reductions in the proposed facilities.....	64
Loss of buyers.....	29	Cost reductions in movement to wholesale facilities.....	65
Summary of inadequacies.....	29	Cost reductions in handling within the market area.....	65
IMPROVING MARKETING FACILITIES		Changes in rents, spoilage, and associated costs.....	66
Need for a modern wholesale food marketing center.....	30	Cost reductions in distribution from wholesalers to retailers.....	67
Proposed facilities for a modern wholesale food distribution center.....	31	Summary of estimated savings.....	68
Description of a standard unit in a multiple-occupancy building.....	32	Potential savings from alternative transportation operations.....	69
Fresh fruit and vegetable buildings.....	34	Nonmeasurable benefits of a modern food distribution center.....	69
Meat buildings.....	34	References cited.....	71
Processed-poultry building.....	37	APPENDIX	
Grocery and food-chain warehouses.....	37	Determining volume, distribution, and marketing costs for present and proposed facilities.....	72
Buildings for manufactured dairy products and eggs.....	37	Determining volume.....	72
Frozen foods buildings.....	38	Establishing the flow patterns.....	72
Fishery products building.....	39	Relation of centers of distribution and population.....	72
Floorspace in the proposed food distribution center.....	40	Determining marketing costs.....	72
Rail connections to buildings.....	41	Detailed cost tabulations.....	73

Summary

Development of a new wholesale food distribution center for Pittsburgh would save an estimated \$1.3 million annually in the cost of marketing. Food groups included in this estimate are fresh fruits and vegetables, meat and meat products, processed poultry, groceries, manufactured dairy products and eggs, frozen foods, and fishery products.

During the study year, an estimated 1.4 million tons of foods moved through wholesale facilities at a cost of \$23.9 million. This volume was handled by 189 wholesale firms, including 4 food chains which handled an estimated 47 percent of the total volume. Trucks brought 63 percent of the foods into the Pittsburgh market, and railroads brought the remaining 37 percent. These marketing facilities served 31 counties in Pennsylvania, Ohio, and West Virginia. About 4½ million people resided in the distribution area, which retained about 95 percent of the food moving through these wholesale facilities.

It is estimated that 116 of the 140 facilities used were inefficient in modern competitive marketing. If such facilities are not improved, wholesalers face further loss of volume to more competitive firms. Even some of the better facilities were encountering urban redevelopment relocation, traffic congestion in most areas, and forfeiture of cost-reducing services available in a modern food distribution center.

The costs most affected by type of facilities were cartage and delay, handling within facilities, transfer between wholesalers in the market, spoilage, and rents. In present facilities all of the above costs except rents were higher than necessary. Generally, rents were low because the buildings had been fully amortized.

Present facilities lacked both rail and truck access, labor saving operations, refrigeration, established business hours, properly controlled traffic, and enforcement of sanitation measures. Some of these inadequacies are difficult to measure in monetary terms.

To improve wholesale food marketing conditions in the Greater Pittsburgh area, facilities have been planned to provide for present and anticipated requirements. Included on approximately 345 acres would be 12 multiple-occupancy buildings for wholesalers in all food groups, 10 buildings for large firms, 5 meat packers and processors, and 4 food-chain warehouses. This acreage would include approximately 125 acres for allied industries.

Food-handling operations would be on a single level at the height of the platform for unloading trucks and rail cars. Associated offices would be at mezzanine or second-floor level. Structures and layouts would be designed for use of modern handling methods. Streets would be wide enough to accommodate market vehicles; parking areas would be adjacent and adequate; nonmarket traffic would flow around the wholesale food center.

On the two lowest cost sites, land and facilities for firms expected to relocate would cost approximately \$39.2 million when completed. It is expected that land would be assembled by the city or county redevelopment authority; an authority could be established to construct the proposed marketing facilities. Facilities would be leased to wholesalers, or land would be sold for facilities that conform to the proposed master plan for the market.

Using authority financing, rentals for various types of proposed facilities could be between \$1.10 and \$1.90 per square foot. Using private financing, rentals are estimated to be 15 percent higher. If all facilities were privately financed, rentals required in a self-sustaining food center would not be competitive with other cities. Regardless of the financing method used, operating savings could be realized only if modern handling practices were adopted. Delay in site procurement could cause the loss of nearly all the potential savings because sites with the required acreage located near the center of population are nearly nonexistent.

Additional nonmeasurable benefits could be expected because wholesalers, buyers, employees, and producers would be working in better surroundings. Better market information could be attained; rail and truck operations would be simpler; food would be in better condition for consumers at possibly lower prices; many sanitation problems could be eliminated; the tax base and revenues to the local government could be increased by new utilization of the vacated land and the opening of the new market area.

Wholesale food markets in urban areas have been under considerable pressure during the past several decades to expand, modernize, and improve handling efficiency. Increased total food consumption caused by population growth has resulted in tremendous volume increases for city markets designed in the era of horse-drawn wagons. Thus, improvement of wholesale food facilities is a necessity.

PITTSBURGH WHOLESALE FOOD DISTRIBUTION FACILITIES

By F. RIDGELY TODD, Jr., agricultural marketing specialist, and PAUL J. HANLON, industrial engineer, Transportation and Facilities Research Division, Agricultural Marketing Service

Background of the Study

Pittsburgh is the major distribution point in the northern Appalachian region, and it is world renowned as a center of steel production. Being the largest metropolitan area in western Pennsylvania, it is also an important financial and commercial center. Steps to diversify industry within the area and means to support properly all of these industries have intensified within the past decade. Feeding approximately 2 million people in the immediate vicinity of Pittsburgh and an additional 2 million people in adjacent counties requires efficient food distribution facilities.¹

At the request of the mayor of Pittsburgh, representatives of the wholesale food trade, the U.S. Department of Agriculture (USDA), Allegheny County, and the city met to discuss the improvement of wholesale food marketing facilities. As a result of this meeting and other requests from industry groups, this study was undertaken with the assurance that a vigorous program of study and improvement would be launched by the appropriate authorities. The improvement of such facilities would be an integral part of broad redevelopment plans. Evidence of the progress in redevelopment is easily seen in the Golden Triangle and the Civic Arena. The most concentrated food wholesaling district is within 1 mile of these two redevelopment projects. Obviously, future redevelopment plans would affect the present food wholesaling facilities.

Changes and improvements have touched almost all phases of everyday life and industry in the Pittsburgh area; however, the wholesale food distribution industry lags. Some improvements

have been made by individual food firms since World War II, but no widespread group action has occurred to improve overall food marketing. Most improvements have been the construction of large buildings for single-level operations away from the high-cost downtown area. This type of construction and location is typical of a national trend in developing facilities to serve modern supermarkets. The comparison of the similar photographs in figures 1 and 2 show only minor changes in downtown facilities between 1900 and 1962.

Located at the confluence of the Allegheny, Monongahela, and Ohio Rivers, Pittsburgh was a natural point for the development of a trade center during the 1800's. Between 1850 and 1950, the area developed as an industrial center, due primarily to the combination of adequate transportation arteries, nearby raw products, and an adequate supply of skilled labor and capital. Between 1920 and 1945, the area saw no substantial new investment. During the post-World War II era, approximately \$200 million in private funds were spent in development of eight or more industrial and housing areas (6.)² Federal and local government participation—with loans, grants, and funds reserved for subsequent use—renovated approximately 500 acres of land. Revitalization and new highways have materially assisted area economic growth in recent years.

Several effective planning and study groups were formed after World War II to assist in area development. Among the planning efforts, several related directly to the wholesale food industry; they included an area transportation study, a regional economic study, city and county plan-

¹ The term "food" in this report is used in a broad reference to include some nonfood items (detergents, patent medicines, sundries) distributed by modern supermarkets and the wholesale trade that supplies these retail outlets.

² Italic numbers in parentheses refer to references cited, p. 71.

ning department studies on land use of specific areas. At least two cooperating organizations of civic and financial leaders have been organized to coordinate development activities (14).



BN-22300

FIGURE 1.—Wholesale produce area on Liberty Avenue about 1900.



BN-22299

FIGURE 2.—Wholesale produce area on Pennsylvania Avenue in 1962.

Consumer demand for food in the Pittsburgh area should remain strong. Industrial employees consume slightly higher than average quantities of food, and union labor contracts in the Pittsburgh area yield good incomes to these workers. Popu-

lation growth is expected to continue at a rate slightly less than the national average.

Feature articles in local newspapers have portrayed the lag in the ability of present wholesale food facilities to serve the public adequately. A modern industrial metropolitan complex must have the ability to serve its people with food at reasonable prices. An important factor in generating the desired economic growth of an area is the portion of a family's income that is spent for food. The Pittsburgh area must remain competitive with other industrial cities, if it intends to continue a well-based economic growth.

As the local citizenry attained an appreciation of the changes confronting the food industry during planning for Pittsburgh's future, the work on this study was easily approached. The objectives of this study were:

1. To determine the volume of foods moving through wholesale facilities in the Pittsburgh area.
2. To estimate the costs of handling this food in existing conditions.
3. To determine the kinds and amounts of facilities needed for efficient distribution.
4. To estimate the total costs of construction and operation in improved wholesale facilities in several locations in the Pittsburgh area.
5. To outline the potential benefits of improved distribution facilities.

Data collection by personal interview with all known food wholesaler firms, transportation firms, and public agencies in Allegheny County started early in 1960.³ The data in this report are based on calendar year 1959 unless otherwise specified. Hereafter, the facilities in Allegheny County will be referred to as the Pittsburgh area.

From initial data, a distribution area served by Pittsburgh wholesalers was defined as consisting of 31 counties in western Pennsylvania, Ohio, and West Virginia.⁴ Distribution data developed by A. Longini for the Pittsburgh & Lake Erie Railroad to show the potential for new distribution businesses indicate a similar grouping of counties (13). The 1960 population of the 31-

³ Food wholesaler firms in this report are defined as firms having handling operations in buildings and selling 50 percent or more of their dollar volume wholesale (as opposed to retail). Names of firms were obtained from trade associations, credit bureaus, tax lists, and telephone directories.

⁴ Counties in Pennsylvania: Allegheny, Armstrong, Beaver, Butler, Cambria, Clarion, Fayette, Greene, Indiana, Lawrence, Mercer, Somerset, Venango, Washington, and Westmoreland; in Ohio: Belmont, Carroll, Columbiana, Harrison, Jefferson, Mahoning, Monroe, and Stark; in West Virginia: Brooke, Hancock, Marion, Marshall, Monongalia, Preston, Taylor, and Wetzel (22).

county area was over 4.8 million. These counties had a population increase of over 6 percent between 1950 and 1960.

The distribution area is served by an improved highway system whose major routes are U.S. Highways 19, 22, and 30 and the Pennsylvania Turnpike (Interstate 80). Interstate highways that

have been proposed or started will further improve major arteries for the distribution of food.

Two railroads serve most of the food industry in the area—the Baltimore & Ohio Railroad and the Pennsylvania Railroad. Several others operate in the county, but they are not important food carriers at present.

THE PRESENT WHOLESALE FOOD MARKETING SYSTEM

Description of the Facilities in the Pittsburgh Area

There were 140 wholesale food marketing facilities in the Pittsburgh area which served 189 wholesale firms. The largest concentration of facilities encompassed 71 structures between the Allegheny River and Liberty Avenue and 16th and 24th Streets, an area known as the "Strip." Lesser concentrations included 10 facilities in the South Side along and near East Carson Street; 13 facilities were scattered in the North Side within a mile of the Allegheny River between the Point-Manchester bridge and the 31st Street bridge. There were 46 other facilities scattered throughout the city and county. Figure 3 shows the approximate location of all known wholesale food marketing facilities in the Pittsburgh area.

It was quite common for wholesalers to be concentrated in an area, to gain their best exposure to buyers and to obtain operating advantages.⁵ Scattered facilities served wholesale firms whose operations consisted primarily of order taking and delivery; such firms were not dependent on visits of buyers. The common features of the various areas such as the number of facilities, access highways, rail service, and general condition of buildings used in the physical handling of foods are presented by area rather than by food group.

Existing redevelopment projects are expected to acquire land used by food wholesalers in the North Side and in East Liberty, an area with scattered facilities. Planned projects in the South Side are to be on plots of only several acres, and they are not expected to interrupt the operations of wholesalers. Although no specific redevelopment plans exist for the Strip area, long-range plans suggest industrial warehousing for this vicinity.

⁵The necessity to centralize facilities in Pittsburgh is shown in: Brown, W. McL. The Pittsburgh Central Produce Market, dissertation for the Doctor of Philosophy degree, 1957, University of Pittsburgh, Pittsburgh, Pa., pp. 101-104.

Strip Area

The Strip area had 51 percent of the wholesale food facilities in the Pittsburgh area; there were 71 facilities used by 83 firms in the 7 major food commodity groups (fig. 4). The use of facilities in the area was as follows:⁶

Fresh fruit and vegetables.....	49
Meat and meat products.....	1
Processed poultry.....	1
Groceries	10
Dairy products and eggs.....	8
Fishery products.....	1
Frozen foods.....	1
Total wholesale food facilities.....	71
Allied industries.....	46
Brokers' offices (buildings).....	3
Nonmarket activities.....	46
Parking	22
Unoccupied buildings or lots.....	12
Total	129
Total of all facilities.....	200

The industries allied to food wholesaling in the Strip included a bank, a container dealer, a flower wholesaler, restaurants, service stations, team tracks provided by the Baltimore & Ohio Railroad and the Pennsylvania Railroad, and similar services. There were three major buildings that had offices (on the second or higher floors) for firms associated with food wholesaling; included in one of these buildings was a fruit auction room.

Most buildings and streets in the area were constructed before 1900. The typical store's main floor was at sidewalk level in a row-style structure. Such stores' dimensions varied from 16 to 30 feet in width and from 60 to 90 feet in depth (front to

⁶For purposes of this report, a facility is defined as an operating area on one or more floors separated from other areas by a firewall or comparable barrier.

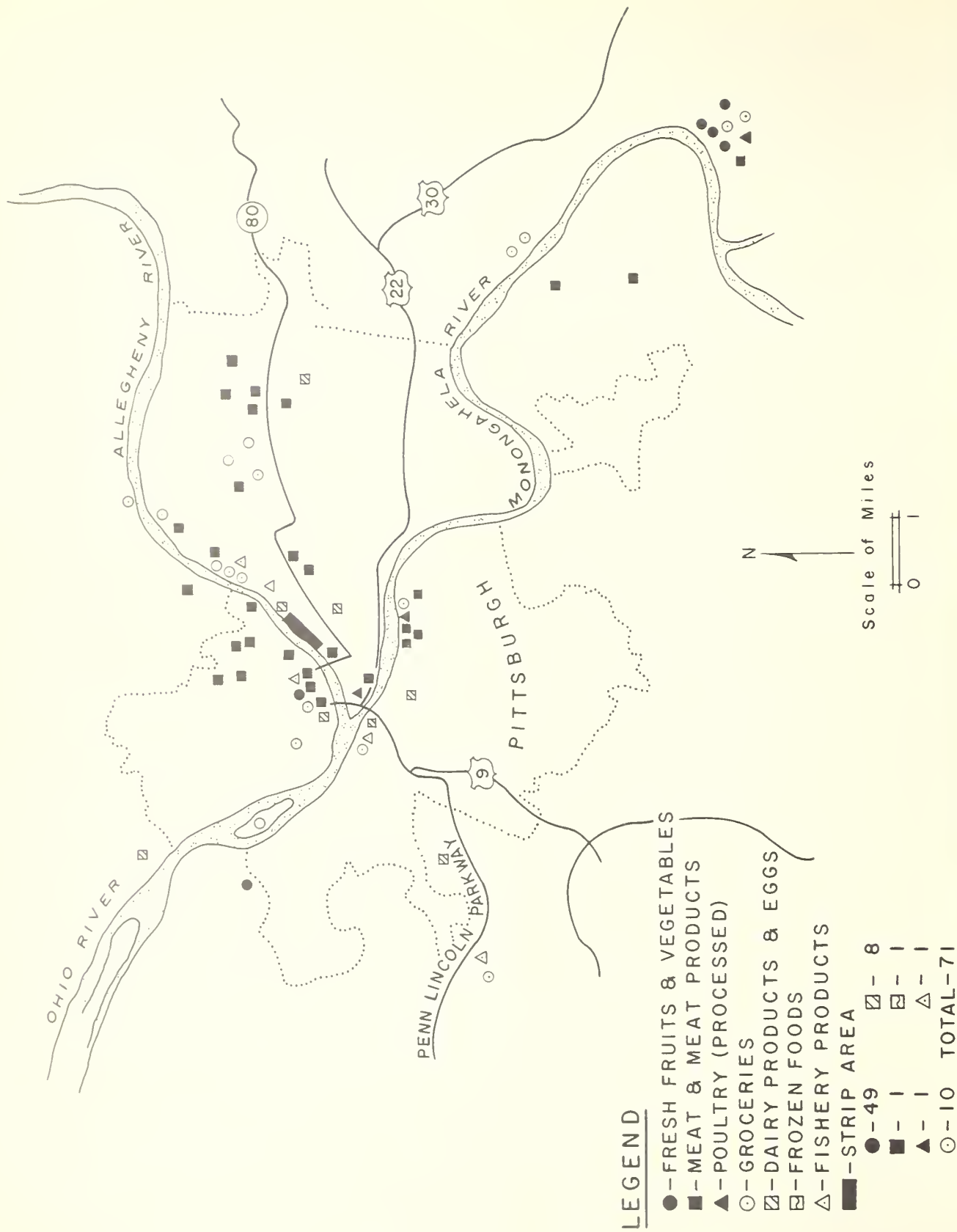


FIGURE 3.—Location of wholesale food marketing facilities in the Pittsburgh area.

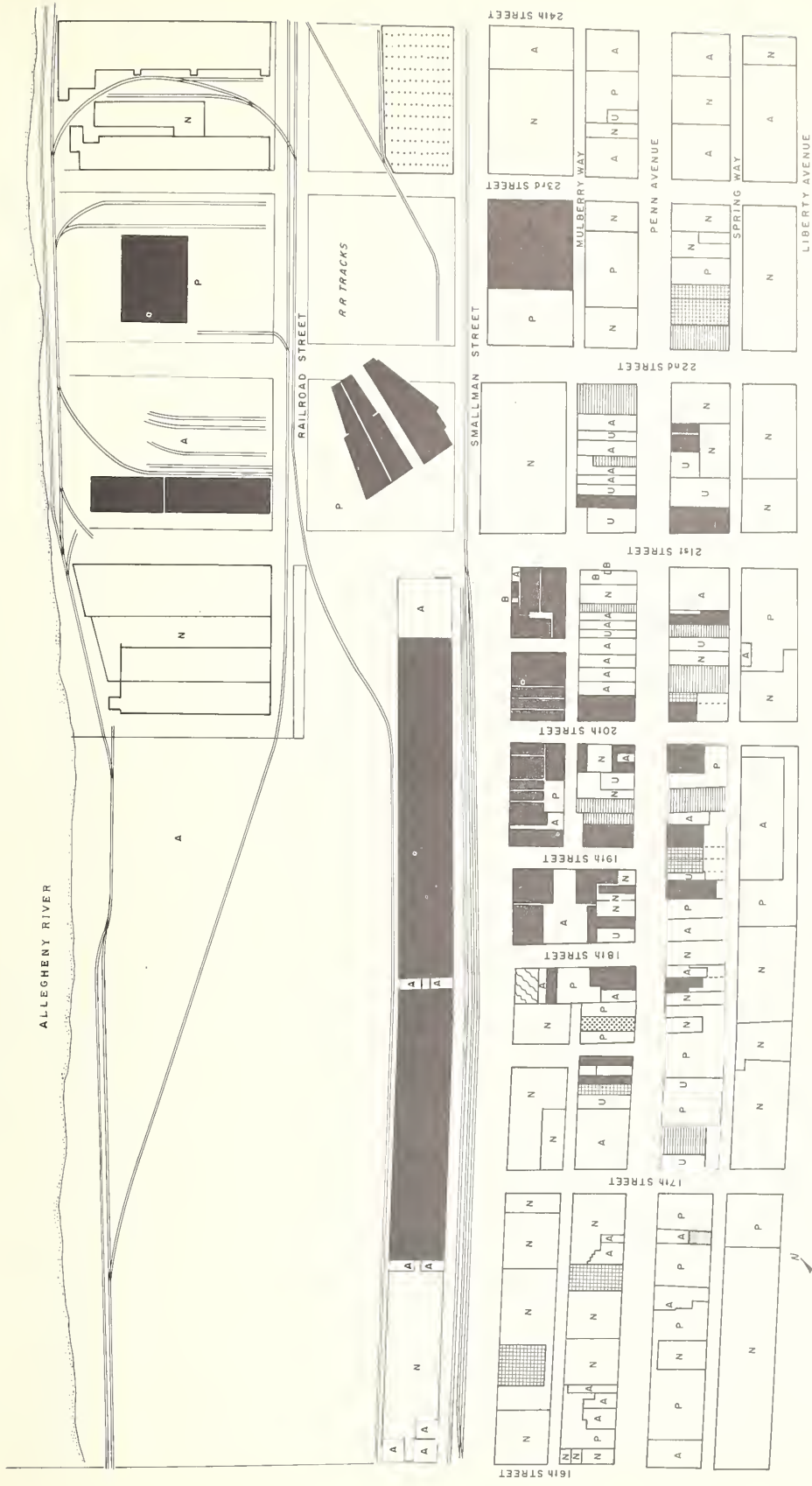


FIGURE 4.—Land use in the Strip area.

rear of building). Streets in front of the row buildings were narrow (28 to 40 feet) and flanked by sidewalks (7 to 12 feet) extending from the curb to the building front. Most of the sidewalks were used for shipping, receiving, and product display; an overhanging roof from many buildings provided limited weather protection.

Approximately 20 percent of the buildings had undergone interior modification since World War II: however, the basic limitations of street width and street-level buildings could not be easily corrected in existing structures. Equipment in these buildings consist of limited refrigeration and handling equipment such as two- and four-wheel handtrucks, elevators between floors, and powered conveyors in fixed locations. Such handling equipment requires excessive hand-stacking operations. However, firms were accustomed to extensive handling operations due to the lack of platforms and limited access to the stores. Alleys behind buildings were too narrow for trucks to pass; consequently, most trucks avoided loading or unloading in them. Most wholesalers did not use rear doors due to poor alley access.

Traffic congestion was a direct result of the narrow streets and slow handling systems used to load and unload trucks. Streetcars and other non-market traffic moving toward the central business district during the peak of the morning market hours accentuated congestion. Details of the traffic situation are considered in a later chapter on inadequacies in the present market.

Parking space was limited. On the narrow streets in front or on the side of wholesale facilities, vehicles had to park parallel to the curb. Only Smallman Street was wide enough to allow trucks to back into loading docks. Twenty-two lots were used primarily for offstreet automobile parking. The Strip area was served by three major streets lengthwise through this concentration of facilities, and by nine cross streets.

The assessed value of land and buildings in the Strip area averaged \$4.43 per square foot. Land values average \$2.61 per square foot, and buildings averaged \$1.82 per square foot (fig. 5).

The entire Strip area has experienced flooding from the Allegheny River in years of severe floods. Flood controls farther up the Allegheny River have reduced the levels that would be expected in the future, but this threat has not been eliminated.

North Side

There were 13 wholesale food facilities, 9 percent of the facilities in the Pittsburgh area, scattered in the North Side within a mile of the Alle-

gheny River. A large vegetable processing plant in the area was not considered in this report because its products were distributed in the Pittsburgh area by another firm. There were seven meat processing and distributing facilities in the area, most of which were operating in individual antiquated buildings situated on streets less than 30 feet wide. A farmers' market and six other food wholesaling facilities were located in this area. Only the larger firms located near the River were served by railroads. The streets to firms farthest from the river often follow valleys and ridges, which are numerous on the North side.

Two national meat distributors that did not maintain other facilities leased unrefrigerated meat docks from the railroads for order assembly and delivery truck loading operations. Cartage companies also operated meat docks for national meat distributors that did not distribute their own products.

Most of the buildings in the North Side were multilevel structures designed for use by one firm. Handling systems (handtrucks, conveyors, and pulley-type operations) were appropriate for the volume handled in each facility. Only four facilities in the North Side lacked platforms. However, the only adequate single-level facility with a palletized operation was a frozen food warehouse.

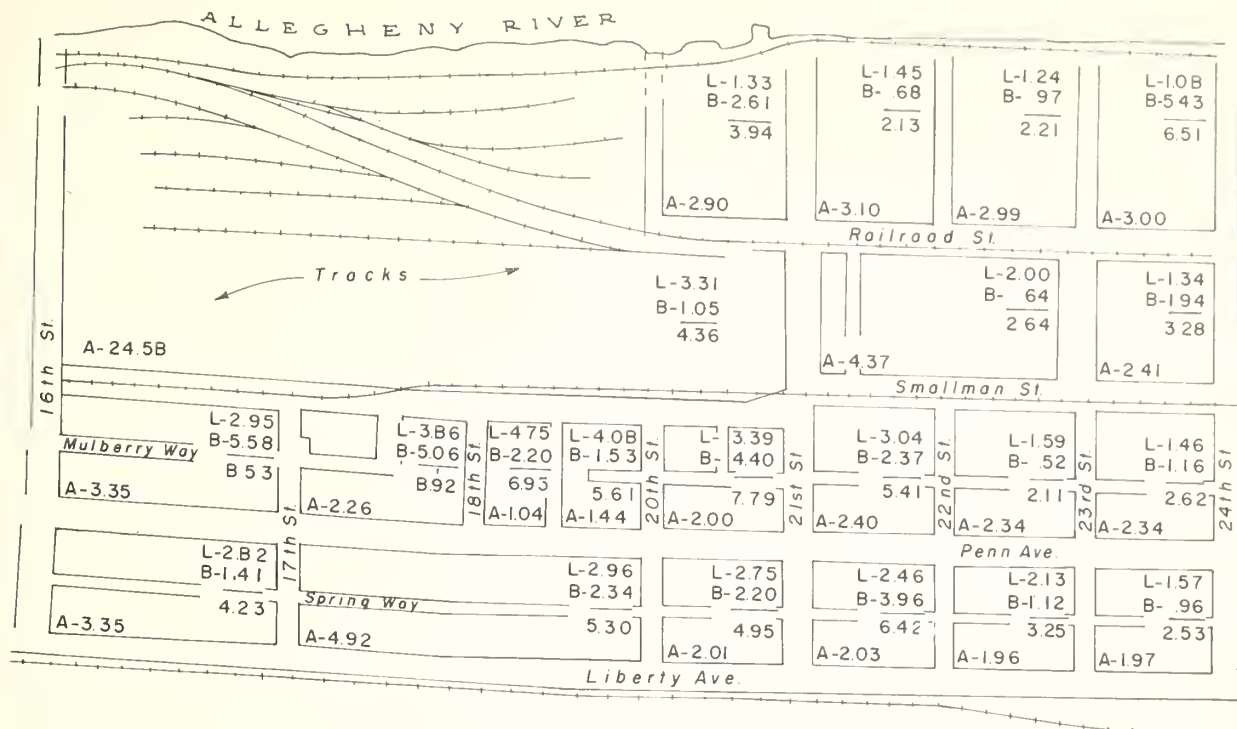
Most trucks were loaded and unloaded with the vehicles backed in at right angles to platforms. Such platform parking did not accommodate traffic efficiently. Automobiles and light trucks had to be parked on narrow streets or on public lots. Considering the narrow streets, traffic congestion was not excessive.

South Side

There were 10 food wholesaling facilities, 7 percent of the facilities in the Pittsburgh area, scattered in the South Side within three blocks of East Carson Street, which parallels the Monongahela River. This street was a principal traffic artery in a predominantly retail district; wholesale operations were located amidst the congestion of the district. Only two wholesale food facilities in this area had railroad connections.

The largest facility was a multiple-floor public refrigerated warehouse, which was used by several food wholesalers. Most of the other operations were housed in row-type buildings similar to those in the Strip area. Two facilities, one housing a local meat processor and the other an institutional grocery supplier, were individual buildings.

Narrow streets flanked by row-type buildings cause parking, loading, and unloading problems similar to those in the Strip area. Within these



LEGEND

AVERAGE ASSESSED VALUE OF LAND AND BUILDINGS IN
DOLLARS PER SQUARE FOOT BY BLOCKS

L--LAND B--BUILDINGS A--ACREAGE/

AVERAGE ASSESSED VALUE FOR THE STRIP AREA

LAND VALUE-\$2.61

BUILDING VALUE-\$1.82

TOTAL ASSESSED VALUE-\$4.43

1/6 GROSS ACRES FROM MIDDLE OF ONE STREET TO MIDDLE OF NEXT FOR EACH BLOCK

FIGURE 5.—Average assessed value of land and buildings in the Strip area.

buildings, products were handled primarily by handtrucks; only limited use was made of conveyors and elevators. During early-morning hours congestion was not as evident as in the Strip area because the district was predominantly for retailers. After 9 a.m., congestion was as burdensome as any congested retail shopping area.

Other Areas

A total of 46 wholesale food facilities, or 33 percent of all such facilities in the Pittsburgh area, were outside the 3 previously discussed areas. These facilities handled about 58 percent of the total food volume. This high percentage was due to major food-chain warehouses and institutional grocery suppliers being located in scattered parts of the city and county.

Two food-chain warehouses were situated in modern facilities which had adjacent areas for ex-

pansion. Three other food-chain operations had facility problems that limited or potentially will limit (within less than 10 years) their effectiveness.

Of these 46 wholesalers, 17 were located about 5 miles outside the city limits of Pittsburgh. These firms tended to serve their local area or extend their operations away from the Pittsburgh area. Nearly one-third (13 wholesalers) of the firms were in modern facilities. It is doubtful that many of these 13 wholesalers would relocate unless there is considerable change in their operation or a potential for a substantial reduction in the cost of operations. The firms that might consider relocation were generally in antiquated facilities located in the blighted townships on Pittsburgh's periphery. Operating conditions in these townships were similar to those in the Strip area; multiple-floor buildings of the row style were commonplace.

TABLE 1.—*Tenure and volume of wholesale food distribution facilities, by food group*

Food group	Wholesale firms renting facilities		Wholesale firms owning facilities		Total number of firms	Total volume
	Firms ¹	Volume ²	Firms	Volume		
	<i>Number</i>	<i>Tons</i>	<i>Number</i>	<i>Tons</i>	<i>Number</i>	<i>Tons</i>
Fresh fruits and vegetables.....	68	397, 900	13	58, 900	81	³ 537, 100
Meat and meat products.....	13	84, 300	18	51, 100	31	135, 400
Groceries ⁴	14	323, 300	15	304, 000	29	627, 300
Manufactured dairy products and eggs.....	13	43, 200	10	17, 500	23	60, 700
Frozen foods and processed poultry ⁵	10	26, 800	4	16, 300	14	43, 100
Fishery products ⁶	7	4, 800	4	6, 800	11	11, 600
Total.....	125	880, 300	64	454, 600	189	³ 1, 415, 200

¹ Firms not showing clear evidence of ownership were classified as "renting."

² Volume and later cost figures for present facilities are summarized in table 23.

³ Includes 80,300 tons that were sold from team tracks and tailgates; this volume did not enter facilities of individual wholesalers. The volumes from rented and owned facilities (456,800 tons) plus sales from team tracks and tailgates equal the total receipts (537,100 tons).

Tenure and Operating Space of Facilities

The 125 food wholesalers in the Pittsburgh area that rented their space handled 880,550 tons of food through these facilities; the 64 wholesalers owning their facilities handled 454,600 tons (table 1). An additional 80,300 tons of food were sold from team tracks and truck tailgates; these foods did not physically enter wholesale buildings.

The total operating floorspace used by the 189 firms in the Pittsburgh area is estimated to be 3,373,700 square feet (table 2). First-floor operating area amounted to 62 percent of total used space; this includes sidewalks and platforms in facilities that utilize such space. Basements and upper floors represented 38 percent of the used space; these levels were used less frequently than the first-floor area. Considering all floors used for operating space, approximately 22 percent (745,000 square feet) was wasted because of poor access and faulty layout.

⁴ Food-chain warehouses are classified as grocery firms, but volume and space (table 2) are allocated to the appropriate commodity group.

⁵ Frozen foods and processed poultry are combined to avoid revealing confidential data.

⁶ Taken from study by Pa. Dept. Agr. and U.S. Dept. Int.

TABLE 2.—*Estimated space used in wholesale food distribution facilities, by food group*

Food group ¹	1st floor	Other floors	Total
	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>
Fresh fruits and vegetables.....	395, 400	72, 000	467, 400
Meat and meat products.....	386, 800	673, 400	1, 060, 200
Groceries ²	982, 700	265, 200	1, 247, 900
Manufactured dairy products and eggs.....	125, 100	70, 100	195, 200
Frozen foods and processed poultry ³	91, 700	125, 800	217, 500
Fishery products.....	124, 400	61, 100	185, 500
Total.....	2, 106, 100	1, 267, 600	3, 373, 700

¹ Public warehouse space leased on an annual basis is included for each group.

² Food-chain warehouses are classified as grocery firms (table 1), but volume and space are allocated to the appropriate food group.

³ Frozen foods and processed poultry are combined to avoid revealing confidential data.

Volume and Movement of Food Through the Facilities

It is estimated that 1,403,600 tons of food from production areas throughout the United States and foreign countries were received by 189 Pittsburgh area wholesalers during the study. These foods were distributed primarily within parts of western Pennsylvania, eastern Ohio, and northern West Virginia, as shown in figure 6.

Many of the wholesalers handled more than one commodity. To avoid duplication in volumes and to facilitate planning and analysis, firms were classified by the major commodities handled. This enumeration of firms in each food group does not show the participation of an individual firm marketing products in more than one group (cross-

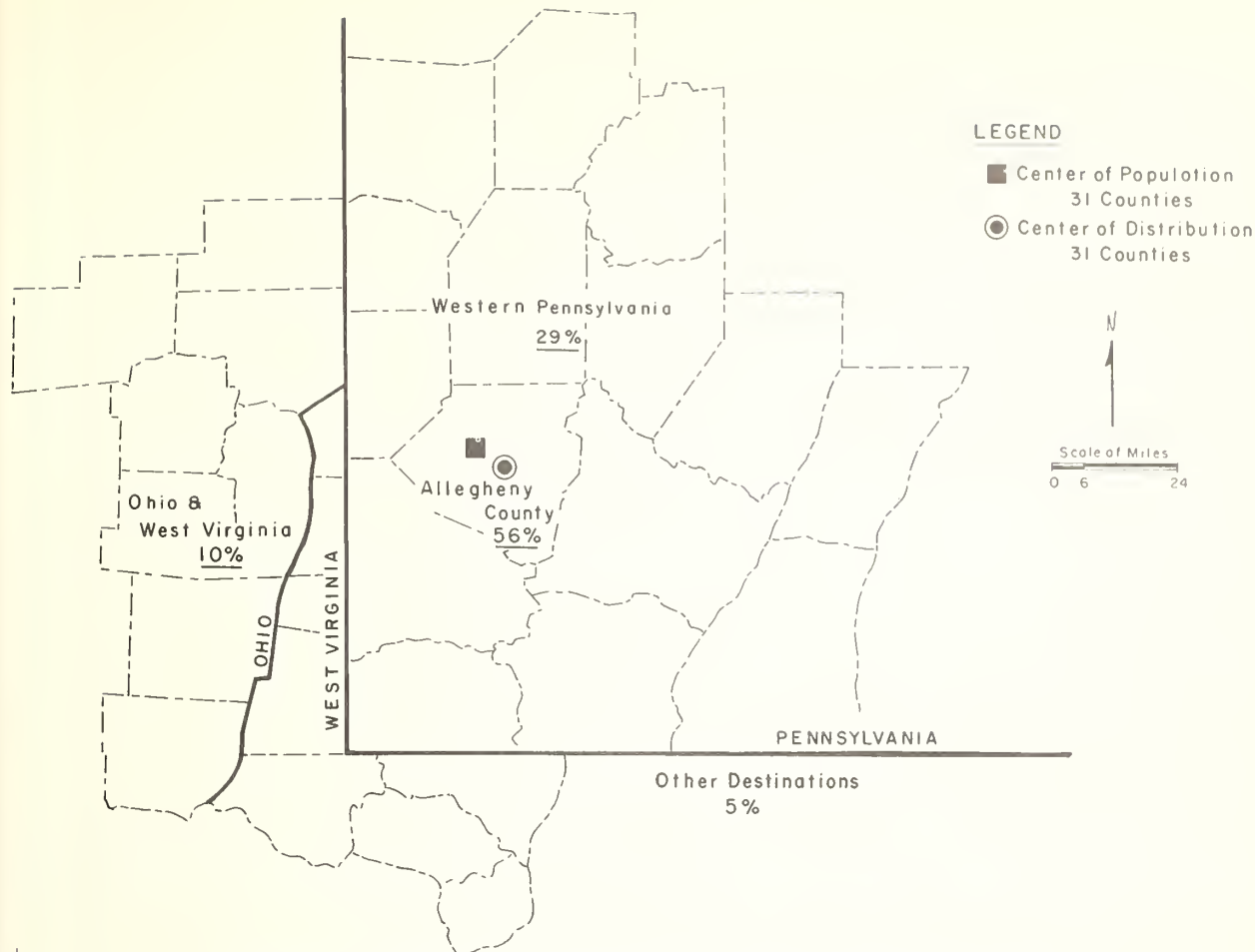


FIGURE 6.—Distribution from wholesale food facilities in the Pittsburgh area.

participation); for example, a food chain is principally a grocery handler. Such a firm does not show in the enumeration as a fruit and vegetable firm; if cross-participation were shown among wholesale operations, there would be over 250 operations. Regardless of the classification of a firm, various food products that make up the total volume for each firm are assigned to the proper food group.

Excluded from the study is the food shipped directly to local food processors and retail establishments, and to public storage warehouses for redistribution to local processors and localities outside of the Pittsburgh area. This volume is not considered because the study is concerned with foods that moved through wholesale distribution facilities in the Pittsburgh area.

This report uses three steps in the analysis of the flow of foods through the marketing facilities: (1) The receipts at initial arrival point within the

Pittsburgh area and the method of inbound transportation, (2) the movement of foods within the market area (Allegheny County) including intra-market transfer between wholesalers and operations within wholesalers' facilities, and (3) distribution to retail and institutional users. This chapter will consider the volume and movement of foods in existing facilities for each commodity group. Later chapters use these same steps in flow to analyze costs in present and proposed facilities.

The wholesale food firms are classified in two categories for this report: (1) Food chains, which include corporate firms representing local, regional, and national chains, and (2) all other wholesalers. In the latter group, there are firms from each food group; the size and scope of these firms varied from large national packers to a local produce jobber. Food-chain warehouses distributed an estimated 47 percent of the volume of

all commodities (including the tonnage purchased from local wholesalers). This percentage was higher than the national average, which was approximately 41 percent.

All Commodities

Foods received at wholesale facilities in the market area originated in 45 known States and 14

known foreign countries. A selected sample of 82 food wholesalers, which handled two-thirds of the total 1.4 million tons of food, showed that these foods arrived by truck and rail. Less than one-half of 1 percent arrived by air and river boat, and these were included with truck receipts (trucks were used for local cartage). Table 3 shows the estimated receipts and method of transportation for each food group.

TABLE 3.—*Estimated receipts of selected wholesale food, by food group and transportation method*

Food group	Rail		Truck		Total
	Volume	Percent of total	Volume	Percent of total	Volume
	<i>Tons</i>	<i>Percent</i>	<i>Tons</i>	<i>Percent</i>	<i>Tons</i>
Fresh fruits and vegetables.....	270, 900	50	266, 200	50	537, 100
Meat and meat products.....	35, 700	26	99, 700	74	135, 400
Processed poultry.....	0	0	13, 500	100	13, 500
Groceries.....	199, 400	32	427, 900	68	627, 300
Manufactured dairy products and eggs.....	13, 300	22	47, 400	78	60, 700
Frozen foods.....	7, 000	24	22, 600	76	29, 600
Total or average.....	526, 300	37	877, 300	63	1, 403, 600

Of the total food volume, 877,300 tons arrived by truck and 526,300 by rail (fig. 7). About 18,600 tons of the products that arrived by rail were placed on team tracks because many facilities did not have house tracks. Moving these products to the facility where they would be assembled for distribution was a necessary function in present facilities, but it would be avoided in properly designed facilities. Some products were sold directly from truck tailgates or from rail cars on team tracks. Such sales require extra labor, which is not highly productive because crews must be maintained at two locations. Tonnages involved in these costly functions are presented in the various commodity group sections to follow in this chapter.

The proportion of truck receipts (compared with rail receipts) varied considerably among food groups, ranging from 100 percent for processed poultry to 50 percent for fresh fruits and vegetables.⁷ In most large cities there has been a decline in many foods arriving by rail. The Market News Branch of the Fruit and Vegetable Division, AMS, indicates that Pittsburgh follows this national trend. In 1952, the receipts of fresh fruits and vegetables in Pittsburgh were only 30 percent

by truck compared with 50 percent during this study (20). Although reliable data are not available for previous years in the other food groups, firms interviewed said that a similar change had occurred for most foods.

The present proportions of receipts by truck and rail indicate that they may be stabilizing near present levels. This stabilization is due largely to arrivals from Western States being primarily rail receipts. The Western States are important suppliers of Pittsburgh and other eastern cities. These percentages of receipts by rail and truck will have an important bearing in the analysis of facilities in later chapters.

When products arrived at facilities operated by either food-chain warehouses (657,100 tons) or other wholesalers (746,500 tons), the food was unloaded, assembled, and loaded for distribution. Some products were processed and packaged before they were distributed within the 31 counties.

The assembly functions required the intramarket transfer of 94,000 tons of food between various wholesalers. With some wholesalers specializing in several items and others functioning as service wholesalers, intramarket transfers were often necessary to supply a good customer with a complete line of merchandise. Even though such transfers cause handling products two or more times, some intramarket transfer is necessary in an efficient marketing system.

⁷Truck trailers on rail cars (piggyback) were rarely received during the study; however, railroad officials expect this method of transportation to increase within the next decade.

ALL COMMODITIES (TONS)

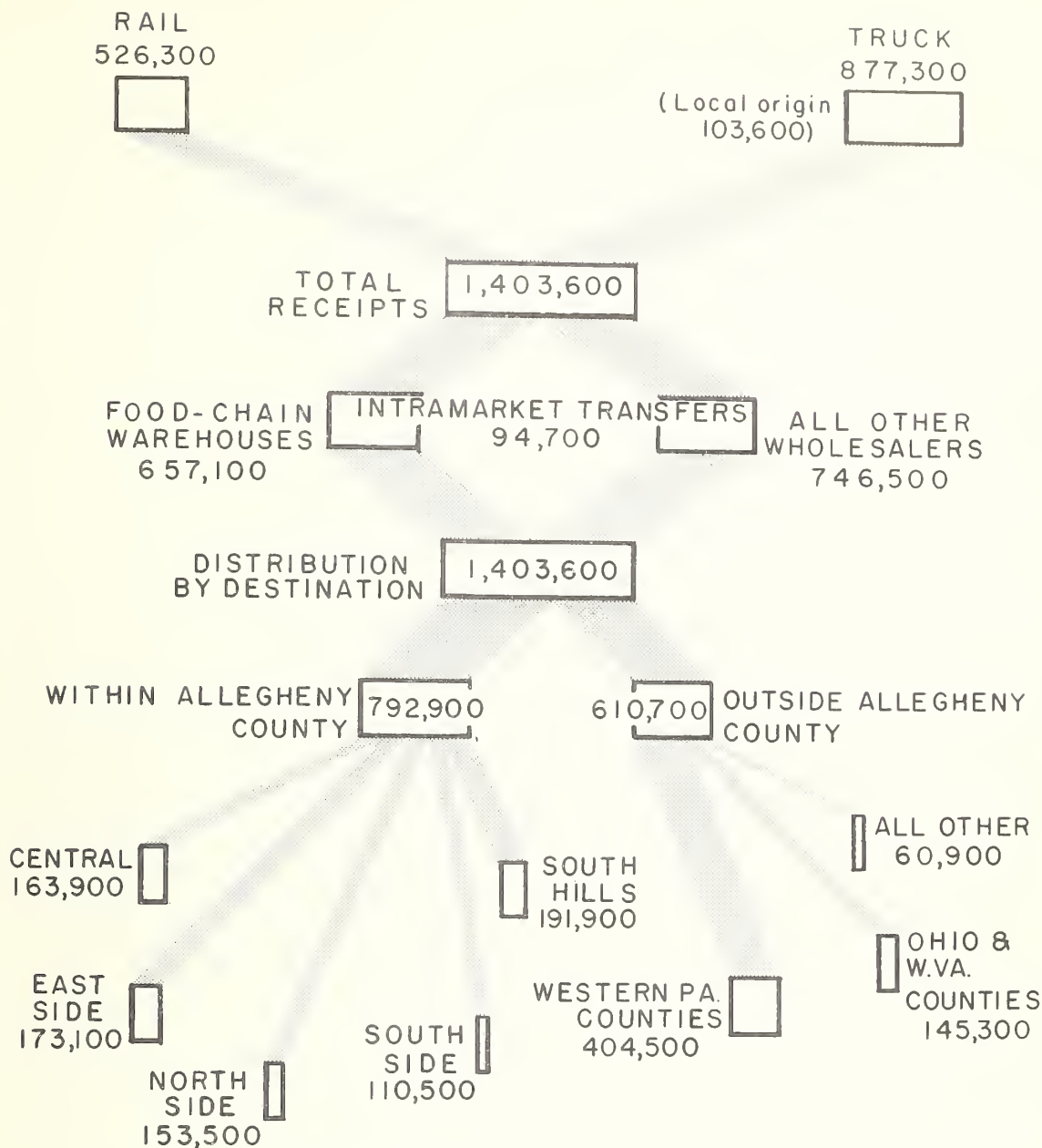


FIGURE 7.—Flow of all commodities through Pittsburgh's wholesale food distribution facilities.

Allegheny County retained 792,900 tons, or 56 percent, of foods, which were distributed to retailers and institutional users in the North Side, East Side, South Side, South Hills, and Central districts (fig. 7). The 30 counties outside of Allegheny County used 610,700 tons, or 44 percent, of the food distributed through Pittsburgh area facilities. As expected, the counties farthest away ob-

tained the least food from Pittsburgh (table 4); other cities such as Baltimore, Buffalo, Cincinnati, Cleveland, New York, Philadelphia, and Youngstown supplied foods to counties on the fringe of the Pittsburgh distribution area.

The same selected sample of food wholesalers referred to in describing inbound transportation methods revealed that only trucks were used in

TABLE 4.—*Estimated wholesale distribution of foods, by food group, in the 31 counties served from Pittsburgh*

Food group	Within Allegheny County		Other western Pennsylvania counties		Ohio and West Virginia counties		All other destinations		Total Volume
	Volume	Percentage of total	Volume	Percentage of total	Volume	Percentage of total	Volume	Percentage of total	
Fresh fruits and vegetables-----	<i>Tons</i> 263, 500	<i>Percent</i> 49	<i>Tons</i> 165, 500	<i>Percent</i> 31	<i>Tons</i> 66, 900	<i>Percent</i> 12	<i>Tons</i> 41, 200	<i>Percent</i> 8	<i>Tons</i> 537, 100
Meat and meat products-----	89, 800	66	42, 800	32	2, 800	2	0	0	135, 400
Processed poultry-----	13, 500	100	0	0	0	0	0	0	13, 500
Dry groceries-----	366, 600	58	175, 200	28	68, 700	11	16, 800	3	627, 300
Manufactured dairy products and eggs----	43, 900	72	12, 000	20	3, 900	6	900	2	60, 700
Frozen foods-----	15, 600	52	9, 000	31	3, 000	10	2, 000	7	29, 600
All commodities--	792, 900	56	404, 500	29	145, 300	10	60, 900	5	1, 403, 600

distribution. However, isolated instances involving rail, river boat, air, and horse-drawn conveyances were observed. Most truck deliveries to retail firms were on established delivery routes for all products except fresh fruits and vegetables. A high volume of such produce was sold to buyers who visited the wholesale facilities. Buyers who visited facilities to purchase food, usually used their own trucks to transport their purchases to the retail store or other users.

In the Pittsburgh area the principal outlets of the food wholesalers were the 3,571 retail food stores and the 3,322 eating and drinking establishments.⁸ Even though there were 12,003 similar retail establishments in the other counties, these more distant establishments used less of the total volume than Allegheny County.

Fresh Fruits and Vegetables

The wholesale fresh fruits and vegetables were handled by 81 wholesale firms (including 49 located in the Strip area) and a farmers' market; their total volume was 537,100 tons. Figure 8 shows the flow of fresh fruits and vegetables through the Pittsburgh market.

Information available on the origin and receipts of fresh fruits and vegetables indicates that about 45 States and 10 foreign countries supplied some products to the wholesalers in the area. Nine States (California, Florida, Pennsylvania, New York, Arizona, Ohio, New Jersey, Texas, and

Maine) supplied over 1,000 carlot equivalents each to the Pittsburgh market (20). Receipts were divided nearly equally between truck and rail.

Operations of the 81 wholesalers differ according to volume and handling functions. Carlot receiving operations were performed by 38 firms. Most of these firms operated in the Pennsylvania Railroad produce terminal with offices and, in some instances, other warehousing facilities in the Strip area. Most produce was unloaded at the facilities directly from long-haul trucks or rail cars. However, 18,600 tons of produce arrived on team tracks and had to be moved to wholesalers' facilities by truck.

Specialized operations such as institutional purveyors, ripening, consumer packaging, and auction operations were performed by 14 firms. Jobber functions were performed by 32 firms. This group of jobbers is becoming smaller and their volume is decreasing.

Food chains were major handlers in the fresh fruits and vegetable business; nearly 133,100 tons, representing about 25 percent of the produce receipts, were handled by chain wholesale facilities. Intramarket transfers to food chains and other wholesalers amounted to 73,800 tons. An additional 47,800 tons were transferred at wholesale level by accounting procedures (not physically moved).

The food chains usually delivered from their warehouses. Many other wholesalers had established delivery routes to retailers on a two- or three-deliveries-per-week basis. Such regular deliveries were usually confined to within 35 miles of the Strip area. Beyond this limit, buyers tended to arrange their own pickup of merchandise. Buyers of small quantities often picked up gro-

⁸ Figures for these establishments represent Allegheny County. However, the four counties in the Pittsburgh Standard Metropolitan Area had 10,341 retail establishments, which used 76 percent of the food handled in wholesale facilities in Allegheny County (21).

FRESH FRUITS AND VEGETABLES (TONS)

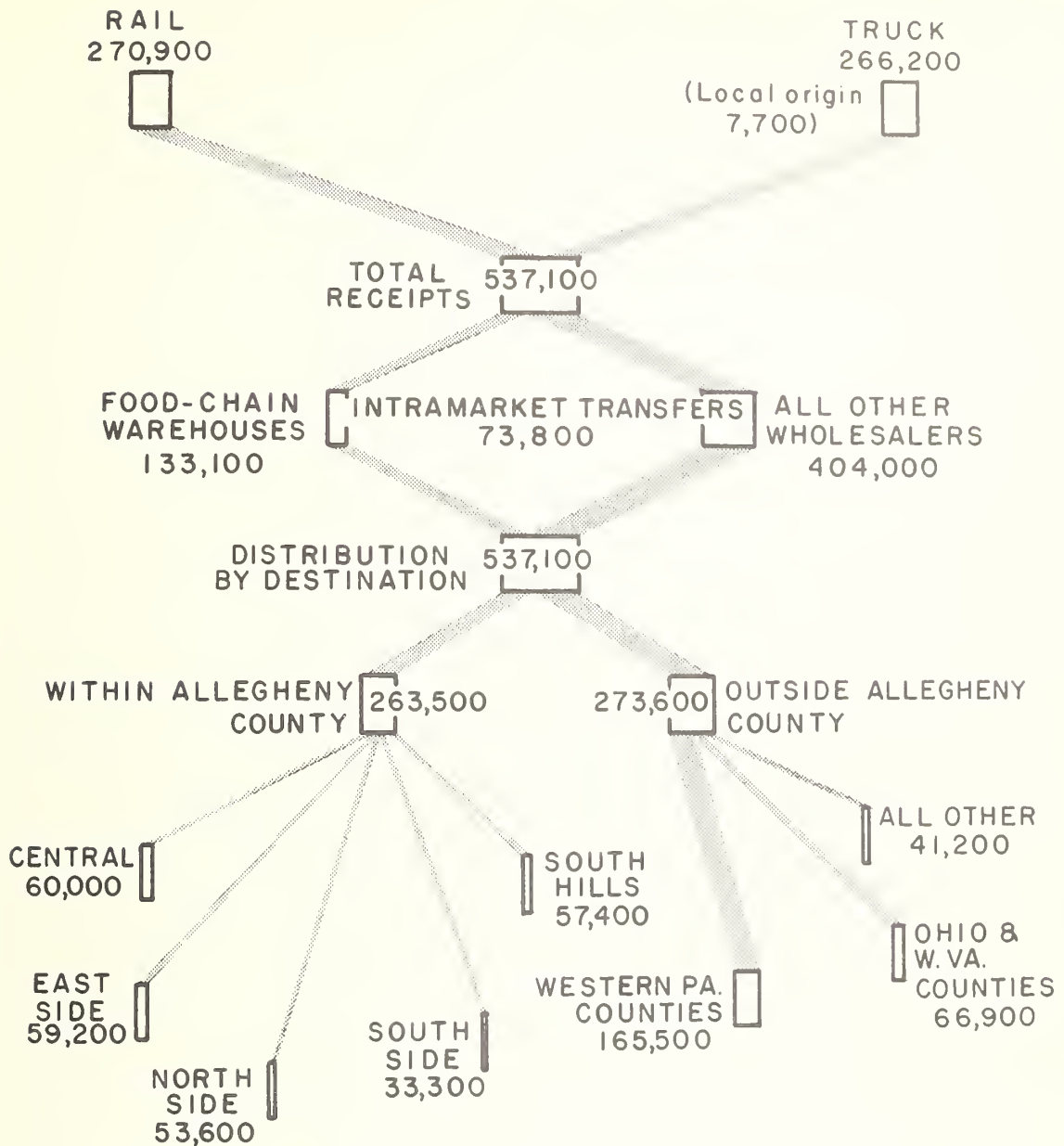


FIGURE 8.—Flow of fresh fruits and vegetables through wholesale food marketing facilities.

ceries, meats, and other products while they were purchasing produce. Purchasers of products to be delivered usually placed orders by telephone. Allegheny County retailed 263,500 tons, or slightly less than 50 percent, of the fresh fruits and vegetables; 273,600 tons moved to locations outside of the county. Due primarily to the distance to other large northeastern cities, Pittsburgh

serves many medium-sized cities from its terminal fruit sales facilities.

Meat and Meat Products

There were 31 firms that handled meat as the major commodity; an additional 10 firms handled meat amounting to less than 50 percent of their

total volume. In the study year, 135,400 tons of meat and meat products were handled through facilities in the Pittsburgh area, including 78,600 tons from animals slaughtered in the area. (See fig 9.)

The primary origin of the meat supply for this 31-county area was the Midwestern States. These States supplied most of the carcass meat and animals for slaughter, although Pennsylvania and adjacent States sent substantial numbers of animals to Pittsburgh for slaughter. Meat receipts (live animals excluded) were 74 percent by truck and 26 percent by rail.

None of the food-chain warehouses had complete central meat cutting, processing, or assembly operations. Most meat products were delivered direct to the retail chainstores from out-of-town sources.⁹ Three national meatpackers processed meat products in Pittsburgh, and carlot distributors represented three other national meatpackers.¹⁰ Slaughtering operations were maintained by 13 firms in the area. The remaining firm performed a combination of processing, wholesaling, and purveying functions within the local area. A total of 12,000 tons of meat (less than 10 percent of the volume) was involved in intramarket transfer between wholesalers. This tonnage was handled primarily by small processors and purveyors.

Night assembly crews in some of the large processing-wholesaling operations were responsible for assembling truck route orders. Although some buyers visited wholesalers' salesrooms, most orders were taken by telephone for truck delivery the following day. Such telephone orders specified uniform cuts and grades which were usually acceptable without the buyers having visually inspected the meat products. Truck delivery systems for meat wholesalers were owned, leased, or operated by cartage firms.

A total of 66 percent of the meat and meat products was retained in Allegheny County; 32 percent was distributed to other western Pennsylvania counties and 2 percent to other States. The percentage of meat moving to other States was low because few local processors had Federal inspection,

which is required for movement into interstate commerce.

Processed Poultry

Only 5 wholesalers were considered to be primarily processed-poultry wholesalers; 10 other wholesale firms handled some fresh and frozen poultry. Of the national meatpackers, three firms maintained poultry distribution departments. The total wholesale volume was 13,500 tons. Figure 10 shows the flow of processed poultry through the Pittsburgh area facilities.¹¹

Processed poultry entering wholesale channels in Pittsburgh originated in 23 States. Georgia, North Carolina, Ohio, Pennsylvania, and several other States east of the Mississippi River were the most important poultry producers for this market area. All known wholesale receipts were by truck.

Poultry slaughtered in the Pittsburgh area was negligible, and no measurable tonnage was involved in intramarket transfer. Because much of the poultry was delivered direct to retail stores, particularly food chains, such volume is not reflected in the total volumes shown.

Most wholesale processed poultry sales were in conjunction with meat or egg sales. Distribution was usually accomplished on delivery truck routes following telephone orders. All known wholesale poultry (13,500 tons) moving through Pittsburgh area facilities was retained in Allegheny County.

Groceries

The wholesale groceries were handled primarily by 29 firms, but 8 other wholesale firms handled some groceries. The total wholesale grocery volume in the Pittsburgh area was 627,300 tons. Figure 11 shows the flow of groceries through wholesale facilities in Allegheny County.

Supplies of groceries originated in most States and many foreign countries. Products were assembled from many places to satisfy the requirements of various nationality groups. Receipts were 68 percent by truck and 32 percent by rail.

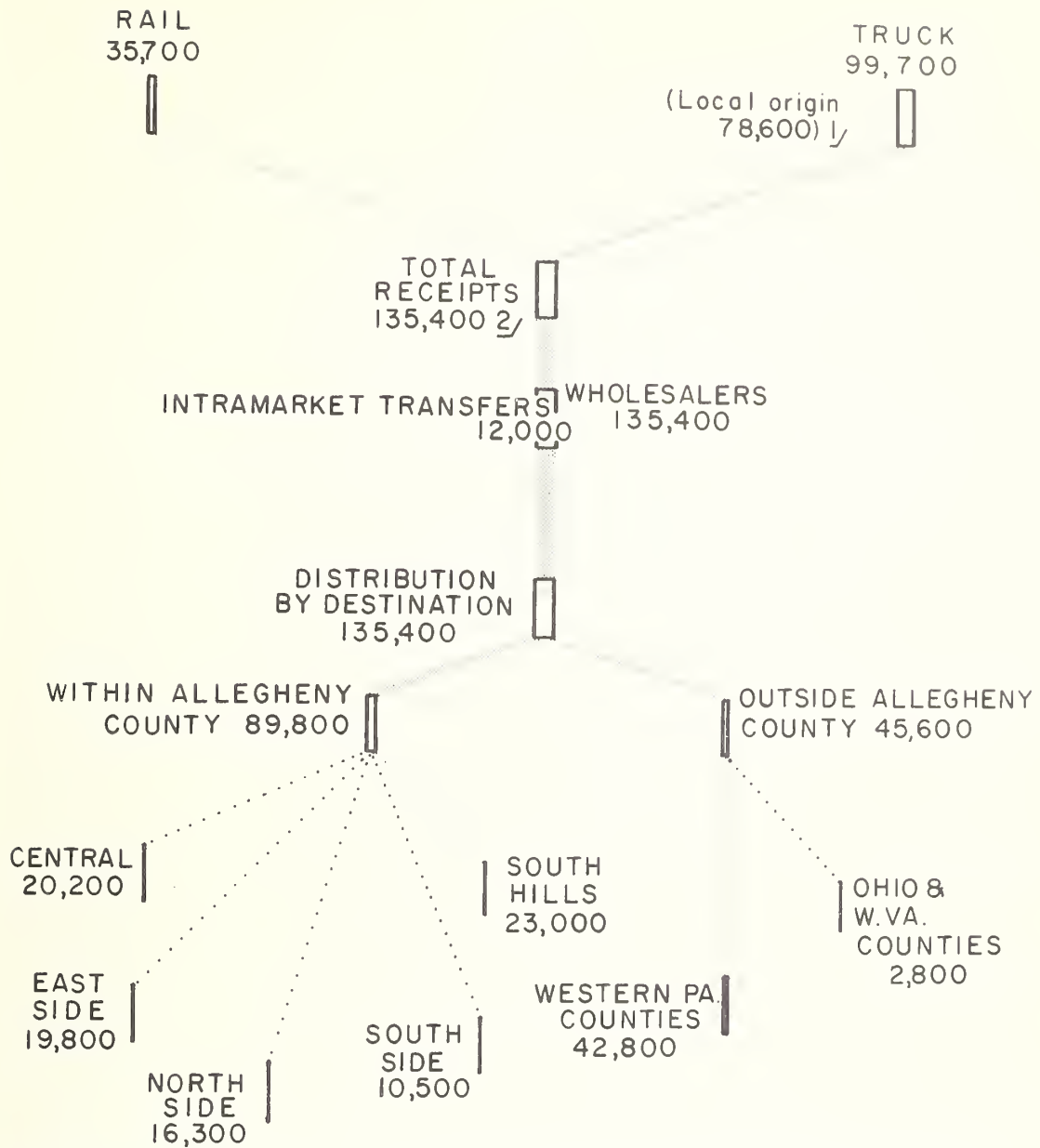
Food-chain warehouses handled 496,100 tons, or 79 percent of the total grocery volume, in 4 warehouses. Another chain operation supplied its retail stores primarily by direct truck shipment from warehouses outside the Pittsburgh area. This volume

⁹ A volume determination of meats moving direct to retail stores was not within the scope of this study. The wholesale volume shown in this section was substantially less than the per capita consumption in the area; this shows the importance of meat moving direct to retail stores. One food chain performs some central meat packaging.

¹⁰ Carlot distributor operations usually involved a freight-forwarding (trucking) firm that delivered meat on designated routes after loading at a meat dock leased from railroads.

¹¹ Several firms combined retail and wholesale poultry operations; these volumes were excluded because more than 50 percent of the volume handled was retail. Live poultry, primarily kosher, was handled by similar firms. Only one chain warehouse regularly handled processed poultry. Percentages of the total volume are not given in order to respect confidential information.

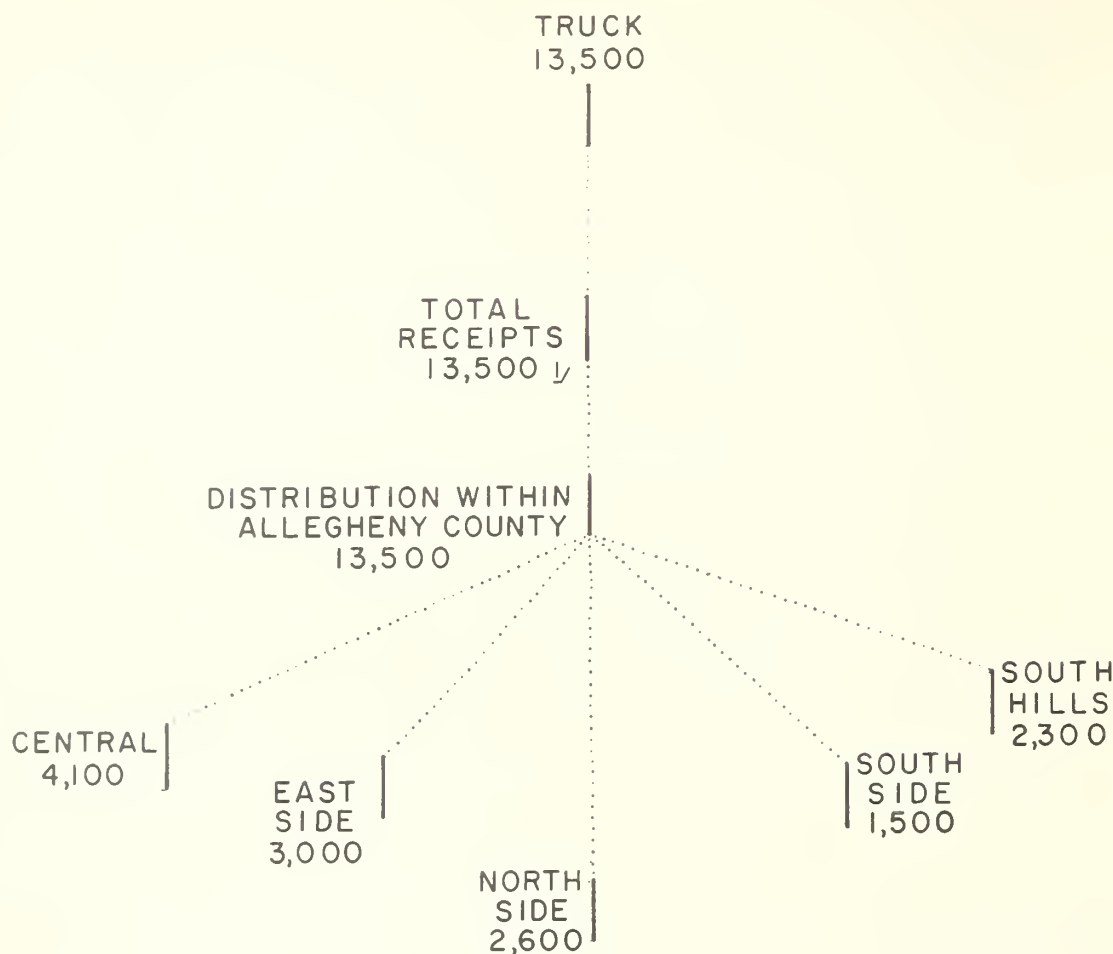
MEAT AND MEAT PRODUCTS (TONS)



1/ Many food-chain retail stores were supplied by direct shipments from outside of the area. Such shipments did not move through wholesale facilities and are not in this volume.
 2/ A negligible volume moved through 2 food-chain warehouses. The tonnage is not shown, to avoid release of confidential data.

FIGURE 9.—Flow of meat and meat products through wholesale food marketing facilities.

PROCESSED POULTRY (TONS)



Food-chains were supplied primarily by deliveries direct to retail stores. Volumes are not shown.

FIGURE 10.—Flow of processed poultry through wholesale food marketing facilities.

ume is not included because it did not involve wholesale facilities in the area. The remaining 131,200 tons, or 21 percent of the groceries, was handled by 33 firms, including institutional wholesalers, nationality specialists, regional general line wholesalers, and local wholesale grocers. Intra-market transfer was negligible because manufacturers made items readily available to all wholesale grocers, and operating margins were too low to allow excessive handling.

Most firms, including food chains, had established delivery routes; however, many local wholesalers operated a cash-and-carry system. With

this distribution system, 58 percent of the groceries were retained in Allegheny County, and areas outside of the county were served proportionately to distance from the Pittsburgh facilities.

Manufactured Dairy Products and Eggs

The manufactured dairy products group excludes fluid milk processors and ice cream manufacturers. Primary products included are butter, cheese, and eggs; these products were handled by 23 firms as the principal commodities. An additional 40 firms handled some manufactured dairy products and eggs, but only 7 handled more than

GROCERIES (TONS)

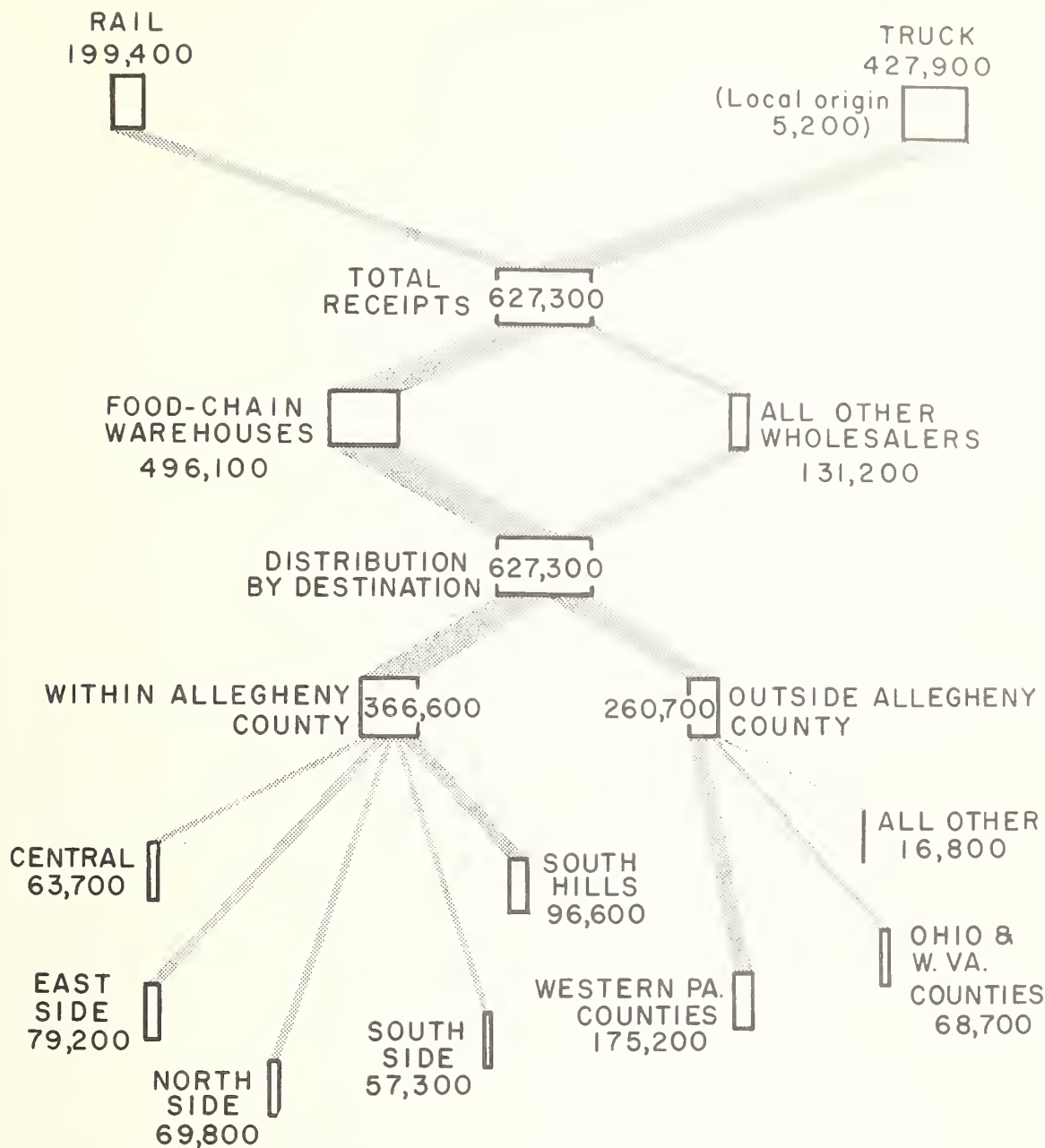


FIGURE 11.—Flow of groceries through wholesale food marketing facilities.

1,000 tons each. Total wholesale volume was 60,700 tons of manufactured dairy products and eggs. Figure 12 shows the flow of these products through the market.

Most egg receipts were from local and regional producer-packers, although egg wholesaling in Pittsburgh involved active, spot, and future market

transactions. Dairy products were shipped in primarily from greater distances (North Central States) than eggs and by a lesser number of highly organized producer-distributors. Trucks brought in 78 percent of the manufactured dairy products and eggs, and railroads 22 percent.

Food-chain warehouses handled only 29 percent

MANUFACTURED DAIRY PRODUCTS AND EGGS (TONS)

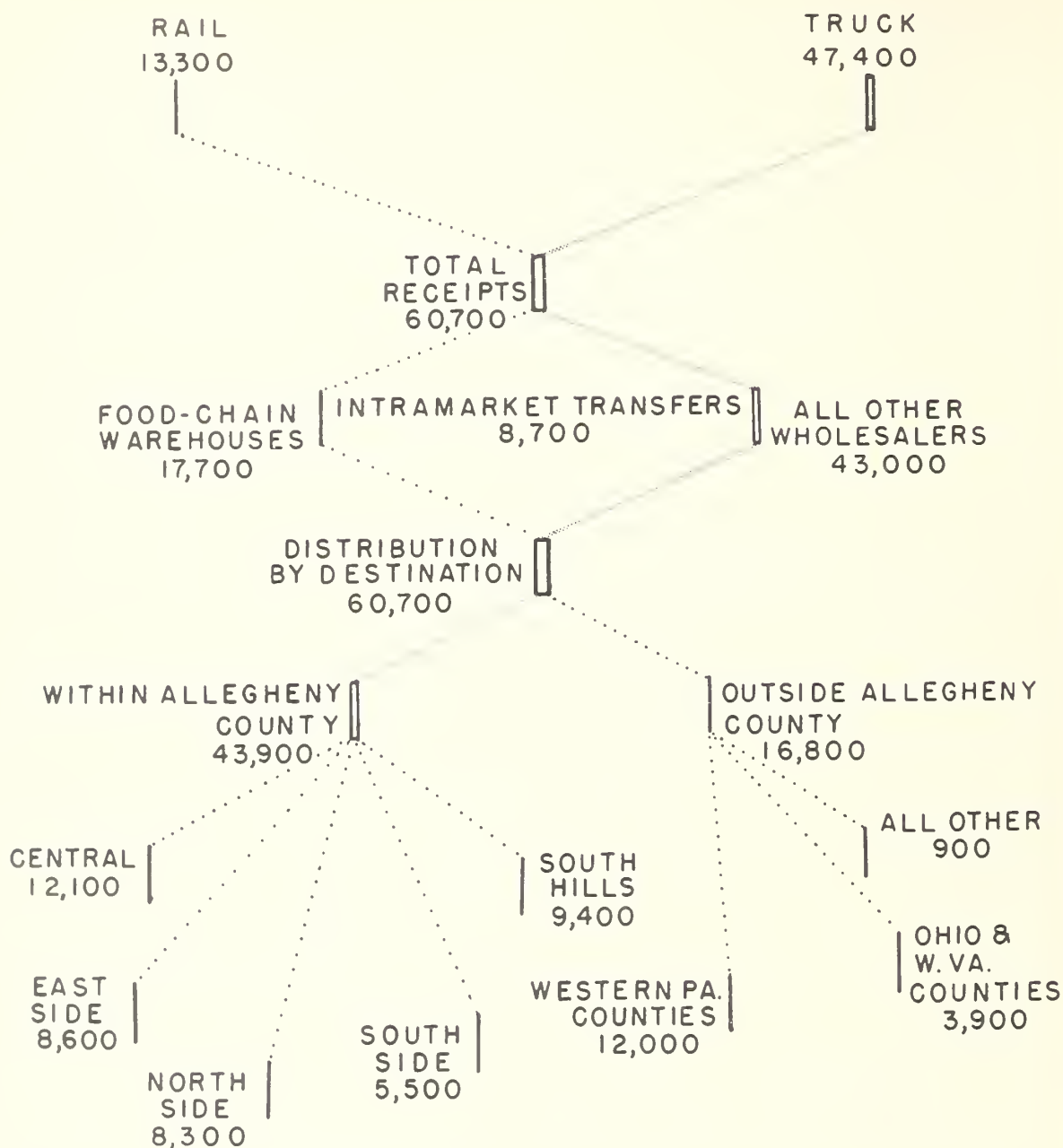


FIGURE 12.—Flow of manufactured dairy products and eggs through wholesale food marketing facilities.

of the dairy products and eggs; this low percentage followed the poultry pattern of movement, with substantial (unmeasured) quantities being delivered directly to the retail store from outside of the county. The institutional and baking trades were the largest users of the remaining 71 percent

of the tonnage moving through Pittsburgh area facilities. Several of the national dairy product distributors maintained warehouses to supply all area users, both institutional and retail groups. Intramarket transfers amounted to 8,700 tons.

Because facilities outside the county served a

substantial part of the egg trade, 72 percent of the combined volume of manufactured dairy products and eggs handled through Pittsburgh facilities remained in Allegheny County. An additional 28 percent was retained by the other 30 counties in the distribution area. Most of these products were delivered by the wholesaler on order.

Frozen Foods

Nine wholesalers handled frozen foods primarily; they handled a total of 29,600 tons. Five other firms handled frozen items to complement their fresh meat or institutional lines. A total of 22,600 tons, or 76 percent of the receipts, arrived by truck, and 7,000 tons, or 24 percent, arrived by railroad. Figure 13 shows the flow of frozen foods through the facilities in the Pittsburgh area.

Frozen products were received from many States and several foreign countries. The most important points of origin were California, Florida, Georgia, Maryland, New Jersey, and New York.

Only one food-chain warehouse assembled a complete retail line of frozen foods, and only three wholesalers were considered as complete line firms in both retail and institutional-size packages. The remaining firms tended to specialize in various frozen products. Because specific firms were exclusive distributors for name brands, intramarket transfer amounted to only 200 tons.

The frozen food industry throughout the country is developing the requirement that frozen products be kept below prescribed temperatures during handling and delivery operations. This requirement will cause the improvement of many of the poor handling practices observed in the Pittsburgh area.

The necessity to maintain low temperatures during delivery over a wide area forced almost all frozen food wholesalers to operate delivery trucks which they owned or leased. Distribution from Pittsburgh facilities extended over the entire 31-county area. Allegheny County retained 52 percent of the frozen foods volume, 41 percent moved to the other 30 counties, and 7 percent went to other destinations.

Fishery Products

Pittsburgh wholesalers of fishery products¹² handled an estimated 11,700 tons of fish and shellfish in the year of this study (18). This volume was handled by 11 firms whose product mix averaged 72 percent frozen, 20 percent fresh, and 8

percent nonfish products. Of the total fishery products, 92 percent arrived by truck, 7 percent by rail, and 1 percent by other means. Intramarket transfer between dealers amounted to 8 percent of the total volume.

The fishery product wholesalers delivered in their own trucks to the same distribution area as the commodity groups covered in this study. Allegheny County used 60 percent of the volume, other western Pennsylvania counties used 17 percent, Ohio and West Virginia used 16 percent, and 7 percent moved to points outside of the 31-county area.

Volumes of fish reported for the Pittsburgh market do not include information from the food chains. However, most food chains purchased at least a part of their fishery products through the wholesalers enumerated.

Facilities used by the fishery product wholesalers were located in antiquated buildings and in congested areas throughout the city, adjacent to many different types of businesses. Most of these facilities were surrounded by nonfood businesses. Costs of handling within facilities and traffic delays were similar to those of other food wholesalers; these costs were higher than necessary. Because of such poor conditions, an area will be shown in the plan of proposed wholesale food marketing facilities for fishery product wholesalers, and further consideration of fishery wholesalers will be given in proposed facility costs and layouts.

Flowers

The Pittsburgh wholesale flower market¹³ consisted of two groups, the downtown wholesale florist firms and the outlying grower-wholesalers (11). The latter group operated directly from their production areas (greenhouses), generally selling their own production. The former group consisted of five firms, of which three were wholesale florists handling primarily cut flowers along with potted plants and some florist supplies, one was a florist greens specialist, and one handled primarily florist supplies, such as ribbon, containers, and pottery. This group maintained their facilities in the area between 11th Street and 43d Street, in the vicinity of the Strip.

Since the Pittsburgh area was a deficit floricultural production area, items were brought from many production areas in the United States, and as far away as Australia. They arrived by direct truck shipment, air, rail express, and bus. Most receipts which arrived at rail or air terminals were picked up by a local cartage company. In addi-

¹² The research and analysis on fishery products and flowers was done by the Pennsylvania Bureau of Markets, which published separate reports for these commodities. Summaries are included here in order that needs of these wholesalers may be considered in planning facilities.

¹³ See footnote 12.

FROZEN FOODS (TONS)

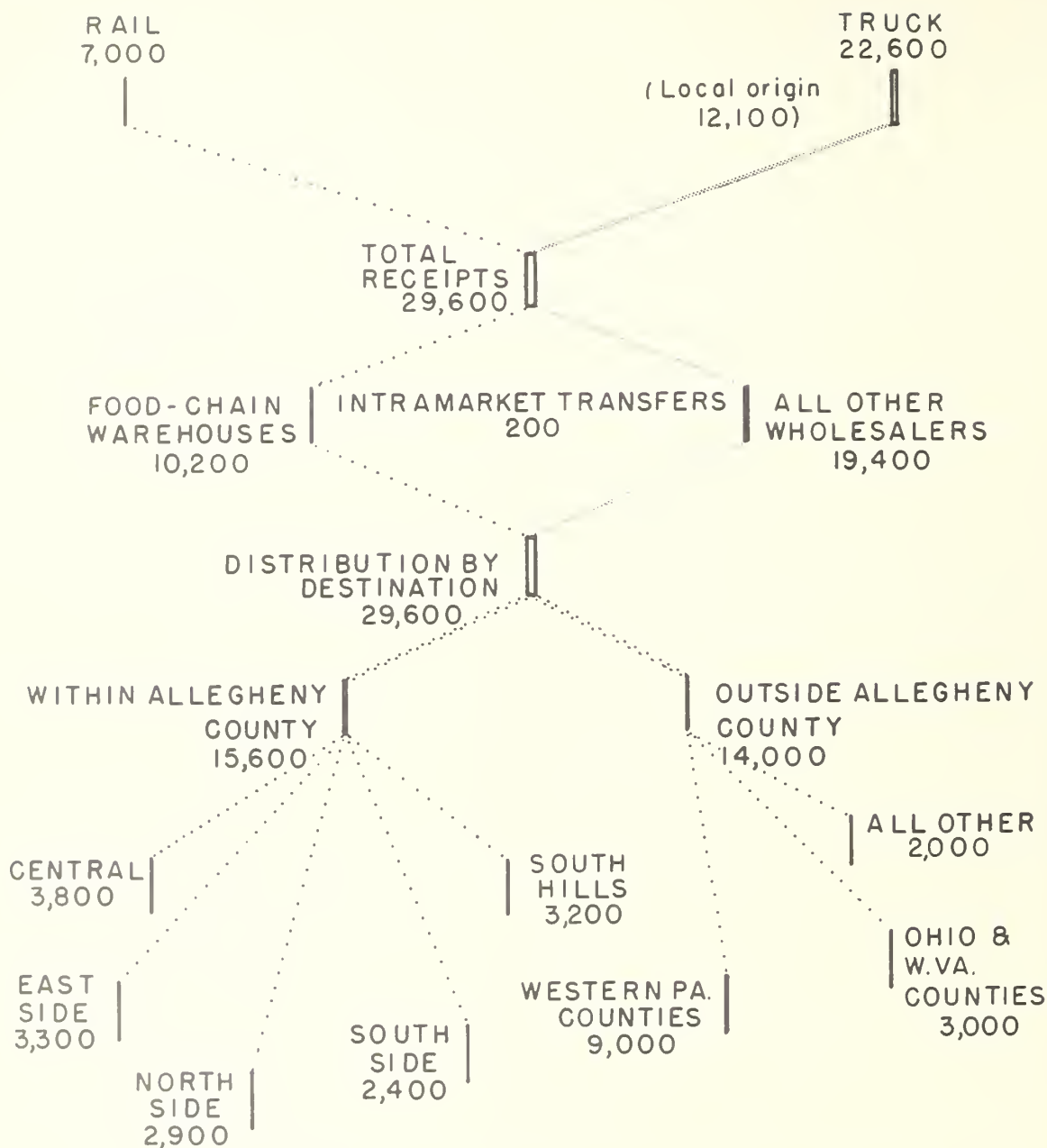


FIGURE 13.—Flow of frozen foods through wholesale food marketing facilities.

tion, this company provided delivery for most of the downtown wholesale florists to the retail florists.

Because of the nature of the wholesale florist business (handling highly perishable products) the margin was generally higher than that found

in food commodities. Five wholesale firms located in the downtown area had a gross volume of approximately \$4 million.

Two firms had made a considerable investment in new facilities near the Strip area. The facilities of the other firms were generally inefficient.

They had waste space because of the arrangements of staircases and small rooms. As land is made available, these firms may wish to build new facilities in the Strip area. If the City Planning Commission finds that wholesale florist facilities are not compatible with the land use plans for this area, these firms could locate elsewhere. Such possible needs have not been included in later proposals for food wholesalers.

Center of Distribution

Figure 6 shows the center of distribution for the 31-county area. This center is the point from which distance weighted by volume was minimized to all calculated points to which foods were distributed.¹⁴ The center of distribution based on volume during the study year was northeast of the Golden Triangle.

Selected Costs Affected by Present Facilities and Movement

The antiquated facilities and their handling limitations caused inefficient wholesale operations, the costs of which are presented in this chapter. These estimated costs may be compared with expected costs of improved operations described in later chapters. Each cost item was selected for its connection with facilities and the possibility of reducing its cost. Hence, this analysis excludes such costs as transportation charges before arrival within the area, management, office personnel and operations, heat, electricity, and telephone charges.

The selected costs follow the three steps in the flow of foods through marketing channels established in the previous chapter. These cost categories are:

1. Costs from the first point of arrival within the Pittsburgh area to the wholesale facilities.

2. Costs within the market area including operations within facilities and handling between wholesalers.

3. Costs of distributing from wholesalers to retailers.¹⁵

4. Costs that are nonmeasurable.

A detailed tabulation of costs and an explanation of methods used are given in the appendix. The components of the costs are as follows:

1. Labor costs with fringe benefits are allocated to each handling operation on a cost-per-ton basis.

2. Truck and handling equipment costs are allocated to each operation on a cost-per-ton basis for the average life of such equipment.

¹⁴ To determine the center of distribution, the densest population points where retail establishments are located in all municipalities in Allegheny County were plotted by map coordinates. These coordinates (representing distance) were weighted by the tonnage of foods moving from Allegheny County wholesalers to all parts of the distribution area. Foods moving out of the county were weighted as if they were moved in the direction of their destination to the Allegheny County boundary. The average of the weighted coordinates yields the center of distribution. The relation to the center of population is in the appendix and on p. 48.

¹⁵ Costs for foods en route to destinations outside the 31 counties include loading, but no transportation charges.

3. Actual facility rentals, or comparable rental value for owned facilities, are calculated.

4. Other estimated costs are demurrage, public warehousing, car icing, shrinkage (includes spoilage, breakage, and deterioration), rail car switching, delays, and contents insurance.

The present cost estimates were made by Midwest Research Institute on the basis of a sample of 82 firms from whom distribution data were obtained. This sample was taken to develop average costs for all types of wholesale operations, including purveyors, jobbers, food-chain warehouses, and wholesalers with mixed functions. Charges are allocated to each operation without regard to who paid the charge. For example, loading delivery trucks may involve both buyer's and seller's labor; but this appears as one cost for loading. All costs were checked by time studies and by comparison with similar operations in other markets in the United States with corrections for wage differences. It is possible that small amounts of any commodity group were handled by methods not shown; however, no wholesaler specified differences during interviews.

Costs From First Point of Arrival to Wholesale Facilities

Costs from point of arrival to wholesale facilities consist of cartage from team tracks to wholesalers' buildings and avoidable delays to inbound trucks. These costs apply only to fresh fruits and vegetables because no other commodities had any significant amount of such costs. The total cartage and delay costs were \$73,900.

Cartage cost includes the unloading of the rail car, loading of the truck, and local trucking to the wholesalers' buildings. Unloading at the wholesalers' buildings was considered as a within-market cost in the next category. Avoidable delay cost was estimated on the basis of time lost due to congestion for inbound trucks other than trucks hauling to wholesalers from team tracks. Com-

pared with other cities, the 37,000 tons involved in cartage and delay is negligible. The low cost, \$1.99 per ton, was due to the close proximity of team tracks to wholesale food facilities, moderate traffic congestion, and good management by wholesalers.

Costs of Handling Within the Market Area

Handling costs within the area include all operations commencing with unloading inbound vehicles, movement within the facility, and ending with completion of loading outbound vehicles. Operations within the facility include moving into warehouses from unloading docks, sorting, processing, and assembling for delivery.

A comparison of handling costs among the food groups is generally indicative of the number of operations required. For example, groceries require more sorting and assembly operations within the food-chain warehouse than the average fresh fruits and vegetables; meat processing requires more operations within facilities than any other food group. Thus, the highest handling cost per ton is for meat and meat products. The costs given in table 5 are averages of the costs of all types of wholesale services so they cannot be compared with the costs of a particular firm. As an example, the costs per ton of a sausage maker-distributor would be greater than the costs per ton of a meat distributor who merely delivers carcass meat taken from rail cars. Such costs follow the general rule that commodities handled in unit lots, such as pallet loads or large boxes, have lower handling costs.

These estimated costs for handling 1,403,600 tons of food within the market area totaled \$9,202,600, an average of \$6.56 per ton (table 5). These estimates were composed of five major activities: (1) Unloading inbound trucks and rail cars cost \$1,503,700; (2) handling within facilities was the most costly series of operations, costing \$4,919,600; (3) loading delivery trucks cost \$1,824,000; (4) handling products sold from team tracks or parked trucks (not entering facilities) cost \$151,400; (5) intramarket transfers between wholesalers cost \$803,900.

The intramarket transfer operations cost \$8.50 per ton, the highest cost per ton among all operations within the market area. This cost was based on 94,700 tons of foods moved between wholesalers, and it includes assembly, loading out, transportation, avoidable delay, and receiving. If the intramarket transfers could be made more efficient or nearly eliminated, a substantial saving could be made.

TABLE 5.—*Estimated average costs of handling and intramarket transfer in the present market area*

Food group	Volume ¹	Cost	
		Per ton	Total ²
	1,000 tons	Dollars	1,000 dollars
Fresh fruits and vegetables.....	537.1	3.37	1,811.8
Meat and meat products..	135.4	16.71	2,261.8
Processed poultry.....	13.5	14.22	191.6
Groceries.....	627.3	6.33	3,972.3
Manufactured dairy products and eggs.....	60.7	13.47	818.0
Frozen foods.....	29.6	4.97	147.1
Total or average....	1,403.6	6.56	9,202.6

¹ Volumes for each food group are indicative of the total receipts for that group. Any quantities handled 2 or more times are reflected in costs.

² Costs are composed of unloading at the wholesale warehouse, handling within the warehouse, loading delivery trucks, team track sales, tailgate sales, and intramarket transfers. (See detailed cost tabulation in the appendix for component costs.)

Compared with other recent studies by this division, the Pittsburgh handling costs are approximately 8 percent higher per ton than similar costs in existing Rhode Island facilities (25) and 2 percent higher than operations in the old facilities in Philadelphia.¹⁶

Rent, Spoilage, and Associated Costs Within the Market Area

Rents and Associated Costs.—Rents, in this study, include the actual rents paid by wholesalers using any type of lease and an estimated rental value for wholesalers that owned their facilities. Some estimates were based upon comparable rents in a specific section of the county, the type of building occupied, and the degree of suitability to the using firm. The average annual rental value in different food groups ranged from \$0.31 to \$1.64 per square foot. Variation of rental values within each food group were as much as \$1.25 per square foot, depending upon the adequacy and age of the structure.

The rentals for most facilities ranged from 10 percent to 20 percent of the assessed values of land

¹⁶ The study of old Philadelphia facilities in 1953 excluded lower cost chainstore operations; however, adjusted by the wholesale index from Bureau of Labor Statistics to 1959, Pittsburgh is still 2 percent higher in handling within market costs (19, p. 18).

and buildings previously presented. However, most of the rentals were comparable to or slightly lower than those in similar cities. The highest costs per square foot existed in frozen foods, where low temperature refrigeration requirements increased cost. Due to large excess capacity in facilities designed to handle meat products, average rental costs among this group were comparatively low. Facilities that were outfitted for certain processing operations had a proportionately higher rental value than those equipped by the lessee. As expected, the rate of inventory turnover has a considerable influence on the rent per ton which the lessee pays. Items held for the longest times are in relatively low-cost space.

Public warehouse charges, demurrage for rail cars used as temporary storage, and insurance of contents were included with building rentals to formulate a total annual rent. The total annual rent for all wholesalers was an estimated \$2,917,300 (table 6), which averages \$2.13 per ton of foods handled. This estimate does not include storage fees paid by brokers.

TABLE 6.—*Estimated rent and associated costs for the present wholesale food facilities*

Food group ¹	Volume ²	Cost ³	
		Per ton	Total
	1,000 tons	Dollars	1,000 Dollars
Fresh fruits and vegetables-----	530. 5	1. 48	783. 6
Meat and meat products-----	119. 7	3. 70	442. 7
Processed poultry-----	13. 5	3. 11	42. 0
Groceries-----	617. 7	1. 79	1, 121. 1
Manufactured dairy products and eggs-----	60. 7	2. 79	169. 4
Frozen foods-----	29. 6	12. 03	358. 5
Total or average----	1, 371. 7	2. 13	2, 917. 3

¹ In a facility handling several food groups, rent was allocated to the groups based on the percentage of the firm's total tonnage in each food group.

² Volumes shown in this table do not include team track and tailgate sales, but they do include intramarket transfers that are handled 2 or more times and tonnage in public warehouses.

³ Costs are composed of rentals, public warehouse charges, demurrage, and contents insurance. (See the detailed cost tabulations at the end of this report for component costs.)

Spoilage and Associated Costs.—In antiquated facilities lacking refrigerated space, spoilage, deterioration, and breakage were costly to wholesalers. In addition, large sums of money were spent to refrigerate temporary storage in rail cars

in an attempt to reduce total waste. The total cost of spoilage losses and extra expenses for car icing and switching of rail cars was estimated at \$2,140,900 (table 7).

TABLE 7.—*Estimated spoilage and associated costs in the present wholesale food marketing facilities ¹*

Food group	Volume	Cost	
		Per ton	Total
	1,000 tons	Dollars	1,000 dollars
Fresh fruits and vegetables-----	537. 1	1. 53	820. 9
Meat and meat products-----	135. 4	6. 94	940. 7
Processed poultry-----	13. 5	2. 40	32. 4
Groceries-----	627. 3	. 42	262. 1
Manufactured dairy products and eggs-----	60. 7	. 90	54. 6
Frozen foods-----	29. 6	1. 02	30. 2
Total or average----	1, 403. 6	1. 53	2, 140. 9

¹ The associated costs are car icing and switching. (See the detailed cost tabulation in the appendix for component costs.)

An important factor contributing to spoilage losses is the numerous handling that products undergo. When truckbed-level platforms do not exist, several hand-stacking operations that tend to bruise fresh food are usually performed. These moving operations also contribute to increased breakage and corresponding waste. Damage that caused deterioration that was not apparent in unopened packages was not included in the spoilage estimate unless the goods were refused by the retail buyer.

The costs of losses from total waste were estimated by wholesalers, checked by the records of a sample, and verified with estimates of refuse removed from various food wholesaling locations. In most food groups, waste averaged approximately 1 percent of the value per ton. Such losses are slightly less than losses estimated in several other recent terminal market area studies. However, above-average efforts and expenses were incurred in Pittsburgh to reduce total spoilage and waste.

Costs of Distribution From the Market Area

Costs of serving the distribution area include labor and equipment costs calculated from the time the trucks were loaded until they delivered the load and returned. Unloading costs are reflected only in the time costs of drivers and helpers on

the trucks; all other unloading costs are considered to be accruing to the retailer. These costs were estimated to be \$9,576,700, an average of \$6.82 per ton of food (table 8).

TABLE 8.—*Estimated costs of distribution from the present wholesale food marketing facilities*¹

Food group	Volume	Cost	
		Per ton	Total
	<i>1,000 tons</i>	<i>Dollars</i>	<i>1,000 Dollars</i>
Fresh fruits and vegetables.....	537. 1	5. 93	3, 184. 9
Meat and meat products.....	135. 4	13. 30	1, 800. 8
Processed poultry.....	13. 5	8. 89	119. 8
Groceries.....	627. 3	5. 82	3, 651. 8
Manufactured dairy products and eggs.....	60. 7	8. 12	493. 0
Frozen foods.....	29. 6	11. 03	326. 4
Total or average.....	1, 403. 6	6. 82	9, 576. 7

¹ Subdivisions of the distribution area are shown in the detailed cost tabulation in the appendix with costs by area.

Most of these costs were incurred in physically moving products from wholesalers to retailers. This cost amounted to \$9,334,100.

A portion of the distribution costs was the avoidable delay to outbound trucks. This delay cost was less than has been found in some other terminal markets; it is estimated at \$242,600.

Primary causes of the delays were traffic congestion and unnecessary waiting for loading.

Some costs, like time losses of buyers (other than truckdrivers) in organizing mixed loads and lay-over time for long-distance truckdrivers, were not estimated. Such costs are not considered to be wholesaler costs; they usually accrue to shippers or final receivers of the wholesale merchandise.

Summary of Selected Marketing Costs

The total selected costs for moving 1,403,600 tons of foods through the Pittsburgh area wholesale facilities was \$23,911,400, an average of \$17.04 per ton (table 9). The highest costs occurred in the handling and distribution operations. Modification of the marketing system would emphasize improvements that would reduce the highest costs as much as possible.

Nonmeasurable Costs

There are, of course, many other costs related to the marketing system. Poor sanitation, poor working conditions, the effect of long hours on other costs, the effect of traffic congestion on activities not related to foods, and the municipal costs of police and fire protection are examples of such costs that also could be affected by the kinds of marketing facilities used and their location. Still other costs, previously mentioned, such as telephone, bookkeeping, postage, and purchasing from producer or manufacturers, would not be affected by the facilities used.

TABLE 9.—*Summary of estimated selected annual costs of moving 6 food groups through the present Pittsburgh wholesale distribution facilities*

Function	Fresh fruits and vegetables	Meat and meat products	Processed poultry	Groceries	Manufactured dairy products and eggs	Frozen foods	Total
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Cartage from 1st point of arrival.....	73. 9	0	0	0	0	0	73. 9
Cost of handling and intramarket transfer.....	1, 811. 8	2, 261. 8	191. 6	3, 972. 3	818. 0	147. 1	9, 202. 6
Rent and associated costs.....	783. 6	442. 7	42. 0	1, 121. 1	169. 4	358. 5	2, 917. 3
Spoilage and associated costs.....	820. 9	940. 7	32. 4	262. 1	54. 6	30. 2	2, 140. 9
Distribution from wholesale facilities.....	3, 184. 9	1, 800. 8	119. 8	3, 651. 8	493. 0	326. 4	9, 576. 7
Total.....	6, 675. 1	5, 446. 0	385. 8	9, 007. 3	1, 535. 0	862. 2	23, 911. 4

Inadequacies in the Marketing System

General inadequacies were described in an earlier discussion of types of buildings and the square footage used. Not all wholesalers' facilities were inadequate or inefficient; some wholesalers who owned their facilities had made limited improvements. The most important faults of the present food marketing system were inadequate facilities, lack of flexibility in receiving, traffic congestion, lack of centralized facilities, poor working conditions, unnecessary waste and spoilage, lack of a coordinating authority, difficulties in pricemaking, and loss of buyers.

Inadequate Buildings

Many wholesalers were located in multiple-level structures of antiquated design (fig. 14). Such buildings often lacked the required floorspace on one level. Elevators between floors were frequently slow, of limited capacity, and poorly located to allow movement of products. This type of building usually lacked the proper interior layout for efficient operations. Aisles were usually not wide enough. If an adequate aisle were provided, it would use too much stacking space. The aisle problem was generally complicated by the heavy two-way traffic caused by the lack of adequate rear entry or exit. Incoming and outgoing products crossed the same sidewalk, which usually was congested with displays and pedestrian traffic. Product movement usually was slowed by a lack of front or rear platforms which necessitated excessive lifting, and lack of organized assembly areas, which are necessary even in the smallest store. Few firms made adequate use of mechanical handling equipment. Refrigeration facilities were

often inadequate, and resultant spoilage was greater than necessary.

The facilities of firms occupying single-level buildings were often adequate, but within these better facilities one or more of the inadequacies mentioned existed. Only a few improved facilities had adequately planned interior traffic patterns. Even fewer firms review layouts as conditions change.

It is estimated that 116 of the 140 buildings observed needed replacement or major modification.

Lack of Flexibility in Receiving

Many wholesalers occupied facilities that lacked house tracks (rail spurs beside their unit); thus, products could not move directly into the wholesalers' facilities from the rail cars. Where house tracks did not exist, rail receipts had to be carted to wholesalers' buildings over distances varying from a few hundred feet to several miles. This cartage was costly. Such costs could be reduced by proper use of house tracks.

At some buildings where house tracks existed an attempt had been made to exclude truck receipts by a prohibitive "unloading fee." Such regulations prevented the best operations for tenants of these buildings. Costs were excessive where it was not possible to handle both truck and rail receipts in the same building.

Traffic Congestion

The Strip had the major traffic congestion problem; in the other food wholesaling areas the primary problem was the lack of parking space.



BN-22298

FIGURE 14.—Typical antiquated buildings.

BN-22297

Some scattered firms, which were located on major highways, experienced individual traffic problems, varying from congestion from shift changes at industrial plants to entry of high-speed arteries. These costs, accruing to scattered firms, had little impact on total food wholesaling costs. Quite the opposite was true in the Strip area; the total cost of avoidable delays was a factor in this area, as was noted in the discussion of marketing costs at the time of the study.

Maximum congestion in the Strip area occurred on Monday and Wednesday mornings between 8 a.m. and 9 a.m. Figures 15 and 16 show the typical traffic in the area classified as large trucks, medium trucks, small trucks, and automobiles; all are further classified as parked or moving vehicles. Traffic data were obtained by mechanical traffic counters at strategic points within the market. Samples of the types of vehicles crossing the counters were made for parts of each hour. Parked vehicles were counted in various sections of the market within the same 10-minute interval for each hour reported.

Traffic prior to 4 a.m. was relatively light, with less than 200 trucks in the area; less than half of these trucks were loading or unloading at the time of the traffic survey. Most incoming pro-

duce was handled during these early-morning hours or after sales hours in the late morning. By 4 a.m. activity was double the average activity of the previous 12 hours; traffic congestion continued to develop as shown graphically. Many of the automobiles belonged to persons not connected with wholesale food distribution; nonmarket automobile counts increased greatly at 8 a.m. These automobiles are explainable in that 40 percent of the area was occupied by other than food distribution firms, and the terrain channeled excessive nonmarket traffic through the area. Maximum truck activity involving approximately 1,000 trucks occurred at 8 a.m. and remained high until 10 a.m. The total traffic count—moving and parked—was over 2,000 vehicles.

Traffic congestion, as shown in figure 17, occurred at several locations:

1. Penn Avenue was a principal artery for traffic entering the downtown business district. This narrow one-way street also had streetcars, and 36 food distribution firms within four blocks use the street and sidewalk in loading and unloading docks.

2. Most numbered cross streets were one way and were so narrow that if medium-size trucks were parked on both sides opposite each other,

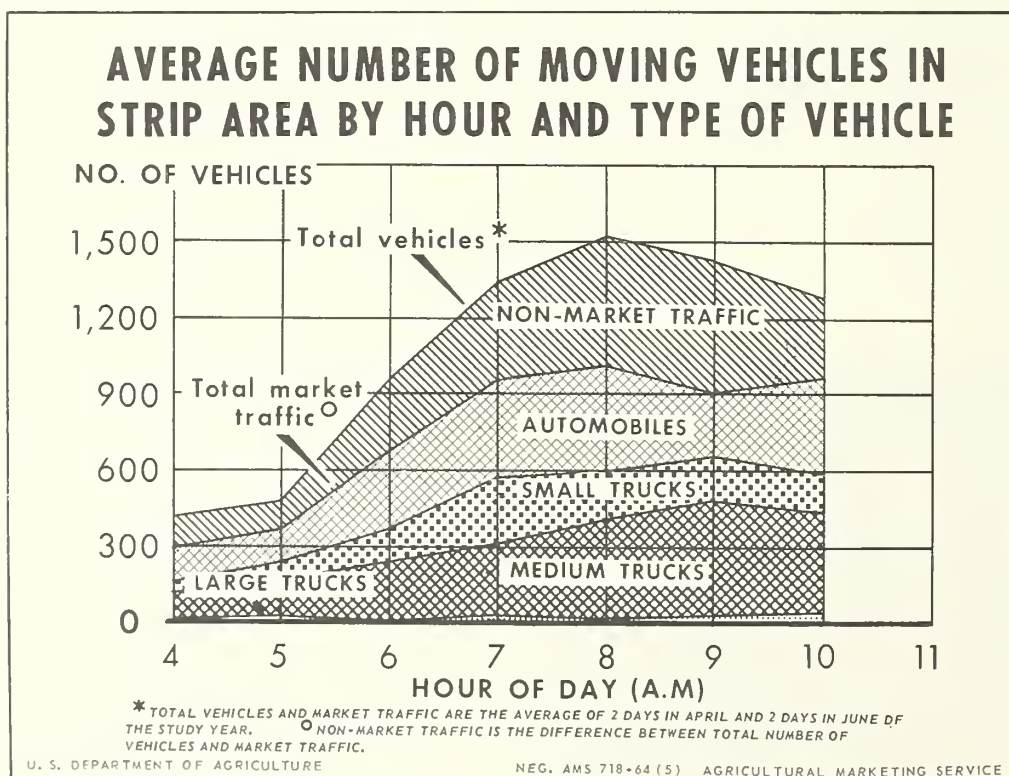
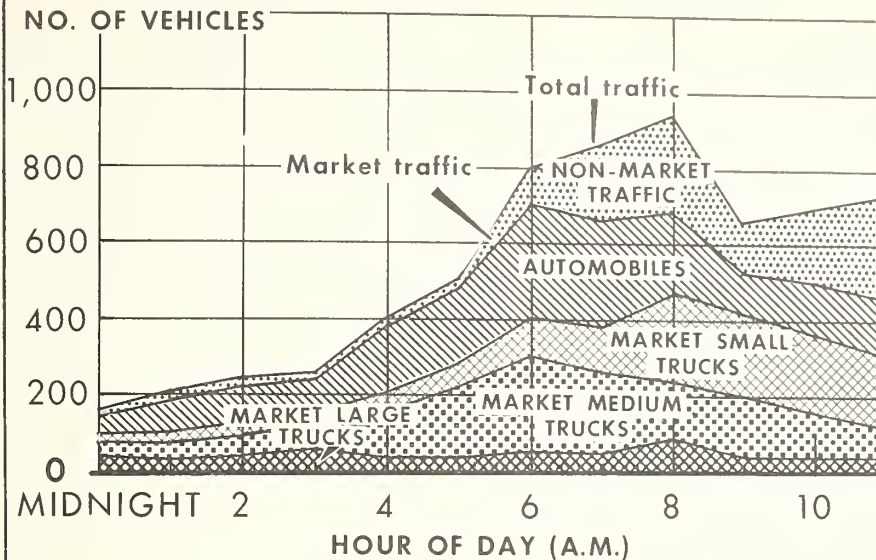


FIGURE 15.

VEHICLES PARKED IN STRIP AREA, BY HOUR AND TYPE OF VEHICLE



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FIGURE 16.

automobiles could not move through the street. During the hours of intense activity, it was not unusual for these cross streets to be blocked for periods in excess of 15 minutes.

3. The intersection of Smallman Street and 21st Street funneled traffic on 21st Street to Penn Avenue and Liberty Avenue. Traffic entering the intersection was generally flowing east on Smallman Street or south on 21st Street from the team tracks and facilities near the river. This traffic could be either intramarket traffic or traffic leaving the area, because 21st Street was the only south-bound street in the east end of the market.

4. The river side of the Pennsylvania Railroad terminal was congested due to the practice of parking on the team track side of the street. This improperly used parking area was required for trucks to maneuver for parking at the terminal docks.

Traffic analysis data indicate that market traffic was 40 percent less on Friday than on Monday. In other words, the market was not at full capacity on all 5 workdays.

Lack of Centralized Marketing Facilities

The scattering of wholesale food businesses throughout the Pittsburgh area made buying and

selling more costly. For example, carcass receipts from outside of the market area were usually distributed over a wide area for additional processing into various products, such as sausages, cold cuts, meats, and other prepared items. These split operations were costly to the processor-wholesaler, and these higher costs were passed on to the consumer.

Wholesale buyers of several commodities often had to travel a considerable distance over congested areas to assemble their merchandise. Buying in this manner discouraged the assembling of food for resale; thus, volume growth for many wholesalers was limited.

Poor Working Conditions

The lack of handling equipment and platforms, the poor sanitary conditions, poorly maintained buildings, and the bad tempers created by traffic congestion did not create desirable working conditions. Many wholesale facilities lacked adequate welfare rooms for their own employees. Clean public restrooms were nonexistent in the market area. Hot water for cleaning purposes was not available in most facilities. Office employees had to endure poor lighting and inadequate temperature control systems. Long working hours in such

poor conditions are a hardship and may cause workers to develop indifference toward their work. Perishable foods moving through such conditions deteriorate because containers are slammed around and broken. Such rough handling increases spoilage.



BN-22301

FIGURE 17.—Typical traffic congestion on narrow streets in the Strip area.

Unnecessary Waste and Spoilage

Fresh food products were stacked for extended periods on exposed sidewalks; extreme temperatures from such exposure hastened decay. Broken packages were pushed into and remained in the gutters where crushing under tires and feet plus exposure to the elements sometimes continued for as much as 24 to 48 hours. These gutters were too close to stacked food to be considered sanitary (fig. 18). It is impossible to measure the full damage to products or the cost arising from improper facilities. Wholesalers' spoilage estimates and refuse tonnage give a basis for estimating such losses. Most fresh products usually do not deteriorate enough to be a complete loss, but the

quality is reduced. In many cases, the effects do not become apparent until the product reaches the retailer or the consumer.



BN-22302

FIGURE 18.—Typical scene of trash and garbage accumulation on the street.

Lack of a Coordinating Authority

Operating hours included time for receiving, assembly, shipping, and sales. Fresh fruit and vegetable sales hours started at 6 a.m. and most sales were completed by 11 a.m. Normal sales hours for groceries, meats, and other commodities were from 8 a.m. to 5 p.m., Monday through Friday. Buyers and receivers were usually functioning 2 to 8 hours earlier; thus produce receiving was an off-and-on operation spread over nearly 18 hours. Reasonable man-hour productivity could not be attained under such conditions. Food wholesalers operated somewhat independently, so it was difficult to establish agreement on effective operating hours. Unions' work rules have come closer than any other means to accomplishing this desired efficiency. The unions apparently understand that they will have to operate according to the hustling morning traditions of the wholesale food industry.

Hourly laborers hired by truckers for unloading food often loitered around the area. This created a social problem as well as encouraging inefficient handling methods.

Market promotion, proper use of rail cars and trucks at facilities, and regulated operating hours often are lacking when there is no market manager to coordinate activities. In an old environment, it is difficult to obtain agreement to give a manager the necessary authority to accomplish coordination. With no market manager, it is difficult for city authorities to coordinate improved traffic control, security, and fire protection.

Difficulties in Pricemaking

One of the important functions of a metropolitan area market is to assist in establishing prices. Although pricemaking at the shipping point has become important, the active demand created in the combined metropolitan markets still affects prices. If facilities and food supplies are scattered in these city markets, it is difficult to determine prices for comparable quantities and quality. Prolonged sales hours caused by scattered facilities and daily fluctuations in perishable food supplies make it difficult to measure demand. Market News branches in several divisions of the Agricultural Marketing Service are responsible for the collection and dissemination of market price and related information for several commodity groups; this task is difficult when the facilities are scattered (20).

Loss of Buyers

Because of increased costs, buyers that had formerly used the market were using other purchasing methods or other places, or were buying substitute commodities. Difficulties in parking, congestion in moving traffic, and prolonged loading times had forced costs beyond the point where many buyers would tolerate such inefficiencies. The wholesale volume in such areas usually drops.

Some of the losses in business of some market areas had been recovered by progressive firms acting as service wholesalers who took orders by telephone and delivered the quality of goods desired. Some wholesalers performed processing and packing functions to attract buyers.

Large-order buyers would not tolerate delays while hucksters haggled with salesmen. However, both large and small volume buyers were in the market to shop for quality and price difference, because such differences exist in perishable commodities for which it is difficult to specify quality in exact terms. If costs are lowered sufficiently and operating conditions sufficiently improved, large-volume buyers and out-of-town buyers are likely to increase their use of the market.

It is not necessarily a bad situation when buyers do not physically come to the market to purchase their requirements; many find that telephone ordering is more convenient. However, if conditions in the market will not permit economical assembly and distribution of orders, buyers will not patronize such inadequate facilities.

Summary of Inadequacies

Most of the facilities in the Pittsburgh market area were built to meet the needs of the age of horses and wagons. Buildings were not designed for modern food-handling methods. At the time of this study, practices often prohibited rail and truck receipts at the same building. Streets were narrow and congested. Wholesale facilities were scattered, and the costs of intramarket transfers between these wholesalers were high. Working conditions were poor. Waste and spoilage were greater than necessary in inadequate facilities. Because of these inadequacies, many wholesalers could not offer buyers goods and services at competitive prices; thus fewer buyers were patronizing the market.

IMPROVING MARKETING FACILITIES

Need for a Modern Wholesale Food Marketing Center

The remainder of this report sets forth the points that must be considered in developing wholesale food facilities that will correct insofar as possible the conditions that have been described and meet the needs of the foreseeable future. These facilities must be designed to serve an increasing number of people whose eating habits have changed from those of their forefathers (15).

Changes in communication, transportation, and handling have occurred since World War II. Many changes are being made in the pattern of assembly, packaging, processing, and distribution of food commodities. With few exceptions, these changes have not been accompanied by changes in the wholesale facilities in which the products are handled in Pittsburgh.

Some food wholesalers have constructed buildings tailored to their business operations with allowances for possible expansion; generally these facilities have been located outside of the antiquated areas. Usually such facilities serve firms that supply their own retail outlets.

Individual action is not the solution for the majority of the food wholesalers. By the nature of the wholesale food business, a market is established so that buyers can purchase a complete line of foods from various commodity wholesalers. Buyers having obtained their goods must be able to move them efficiently over adequate arterial highways to their places of business. Wholesalers should have a place where foods in rail cars can be divided, when necessary, in an efficient manner. Adequate public warehouses, parking, offices, and other business services should be close at hand. All of these factors indicate that food wholesalers should not take individual action which would spread "the market" over a vast metropolitan complex. If total market effectiveness is lowered beyond a certain point determined by each businessman, it reflects on other phases of the area's economy.

The Pittsburgh area has been experiencing slow economic growth. Some large businesses have looked toward other parts of the country for expansion purposes. Food distribution costs in Pittsburgh are higher than in some other cities and are unfavorable to economic growth (p. 22). These problems contribute to the general necessity for taking group action to build a modern wholesale food marketing center.

The broad economic and social problems of the Pittsburgh area have caused considerable evaluation on the part of city, county, and private planning organizations. Substantial area redevelopment plans have been formulated. These plans include the relocation of many food wholesalers. The planners have given priority to consideration of a modern wholesale food center so that a site will be available for possible relocation of such uprooted firms. Also, they wish to take advantage of possible distribution economies and to improve job opportunities within the area for employees of wholesale food firms.

Pittsburgh needs a new wholesale food distribution center in which all types of foods may be unloaded from rail cars and trucks directly into efficient facilities. Buildings should be designed to permit the use of proper handling equipment for moving products into, within, and out of them. Such buildings should have front and rear entrances to facilitate an economical flow of products through the space. Streets between the buildings should be wide enough for trucks to back into the platforms with sufficient street clearance to allow smooth traffic movement. Generally, each facility should be large enough for a wholesaler to handle all of his products in one building with space for refrigerated and dry storage plus necessary processing and assembly. Adequate parking space should be provided.

In planning the food distribution center, provisions were made for individual buildings for meat-packers, food-chain warehouses, and other large operators. Consideration was given to allied industries, such as processors, beverage bottlers, service groups, banks, truck repair shops, a data-processing center, and similar firms. Railroads and trucks could serve a centralized food area with greater ease and at less expense. Such a food district can be economically developed only if it is started with ample, reasonably priced land and if group action is focused on problems of development.

In spite of the great need for a complete wholesale food center in the Pittsburgh area, certain factors tend to slow development. First, some wholesalers are interested in a new market only if a substantial portion of their commodity group can be relocated. Second, some wholesalers owning comparatively modern facilities resist changes that may place them in a less favorable competitive

position. Some wholesalers are continually renovating their old facilities. Not all firms can be expected to be in a position to move simultaneously. Some wholesalers, while grasping the significance of the benefits that could be derived for their firms from a new wholesale food center, have adopted

a wait-and-see attitude. Others are not financially able to move unless alternative uses for property they own are developed. Ultimate decisions by both large and small firms will be based upon the understanding of what such a food distribution center has to offer them.

Proposed Facilities for a Modern Wholesale Food Distribution Center

Five considerations basic to the development of plans for a wholesale food marketing center are:

1. Suitability of building designs for functions required.
2. Adequacy for present and prospective needs.
3. Location.¹⁷
4. Proper arrangement and groupings of buildings.¹⁷
5. Cost of facilities and maintenance services.¹⁷

The kind and amount of facilities planned for the proposed Pittsburgh food distribution center are based on the estimated volume of business and specialized requirements of 166 wholesale food firms operating in antiquated facilities or within urban redevelopment areas. These firms should be interested in moving to a modern food center within the decade. During the year of the study, these firms handled an estimated 1.3 million tons of foods in 2,881,100 square feet of space.

In the proposed facilities, 2,548,280 square feet of space in 31 buildings is provided (table 10, p. 42). About 12 percent less space is required in proposed facilities because better interior arrangements have made improved use of the space possible. Floorload capacity and ceiling heights are sufficient to accommodate higher stacking than is possible in most existing facilities. Although space is proposed for 23 fewer wholesalers than operated during the study, the space could accommodate the volume handled by the 189 existing firms.

Operations of these firms made it desirable to provide several types of facilities: (1) Multiple-occupancy buildings in which several wholesalers are located in a single building, (2) individual buildings to accommodate only one wholesale firm, and (3) miscellaneous service facilities. In general, large-volume wholesalers and firms requiring special features in buildings are located in individual-occupancy buildings. Other wholesalers with standard commodity lines are housed in the multiple-occupancy buildings.

The number of wholesalers expected to utilize the food distribution center should be determined by the number of responsible wholesalers who sign bona fide commitments to lease or construct building space in the center. Therefore the number of facilities actually constructed may vary from the number used herein. Interior and platform arrangements are flexible and depend on the requirements of each firm. Layouts presented herein should be considered as guides.

The miscellaneous service facilities include house tracks, team tracks, office space as a second floor in a multiple-occupancy building, wide streets, parking areas, a farmers' market, and restaurants. Although not included in costs to follow, space is provided for a bank, gas and service station, and other allied industries.

In the following sections the facilities proposed for each type of wholesaler are described. Particular attention is given to the layouts for firms of moderate volume that would probably go into multiple-occupancy buildings. Layouts for individual-occupancy buildings are not presented because the requirements of these operators vary. Other Marketing Research Reports published by the USDA suggest layouts for both multiple-occupancy and individual-occupancy buildings. Also, they discuss some of the materials-handling equipment and methods that might be used in conjunction with these facilities.¹⁸

Inventory turnover rate, size and weight of the product, and the amount of processing performed create substantial differences in the space required

¹⁷ These subjects are presented in the following chapters of this report in the sequence indicated.

¹⁸ Wholesalers interested in improving layouts and reducing operating costs can obtain single copies of the following reports from the Office of Information, U.S. Department of Agriculture, Washington, D.C., 20250: Methods of Increasing Productivity in Modern Warehouses (3); Grocery Warehouse Layout and Equipment for Maximum Productivity (5); Measures of Operating Efficiency in Wholesale Food Warehouses (4); Improved Design for Commercial Egg Grading and Packing Plants (10); Wholesale Fruit and Vegetable Warehouses—Guides for Layout and Design (1); Receiving Fruits and Vegetables in Wholesale Warehouses (2); Evaluating Delivery Operations of Wholesale Food Distributors (8).

by each food group (12). For example, the turnover of fresh fruits and vegetables is at least weekly, or more than 50 turns per year; whereas grocery items may have approximately 18 turns per year.¹⁹ Thus the space-per-ton requirements for grocery operations will be greater than that for fresh fruits and vegetables if the size and weight of the products are similar.

Regardless of the type of facilities, functional buildings should be constructed to keep costs to the lowest level consistent with local building codes and users' specifications. Often it is possible to contract for construction at a time convenient to the builder; this allows the possibility of minimizing total costs.

Description of a Standard Unit in a Multiple-Occupancy Building

Most wholesale food firms who move less than 20,000 tons per year through facilities could operate efficiently in one or more units of a multiple-

front platform edge to rear platform edge.²⁰ Each unit is 25 feet wide although a firm may have two or more units without having any interior walls.

Platforms on the front and rear are 14 feet deep to allow two-way traffic and the temporary placement of handling equipment or assembled food products. The roof of the front platform should extend at least 6 feet beyond the edge of the platform to protect loading and unloading operations from adverse weather. To minimize the problems of winter operations, the front platform could be enclosed with overhead doors near its outer edge. Such doors are optional, and their cost is not included in calculations. These platforms should be 45 inches above the road level or above the tops of the railroad tracks, which are placed parallel to the rear platform. If refrigerated rail cars would use the house tracks, the platform should be 55 inches above the tops of rails. All house tracks should be set in paving to allow trucks to back up to rear platform when tracks are not in use. A bumper should be attached to the edge

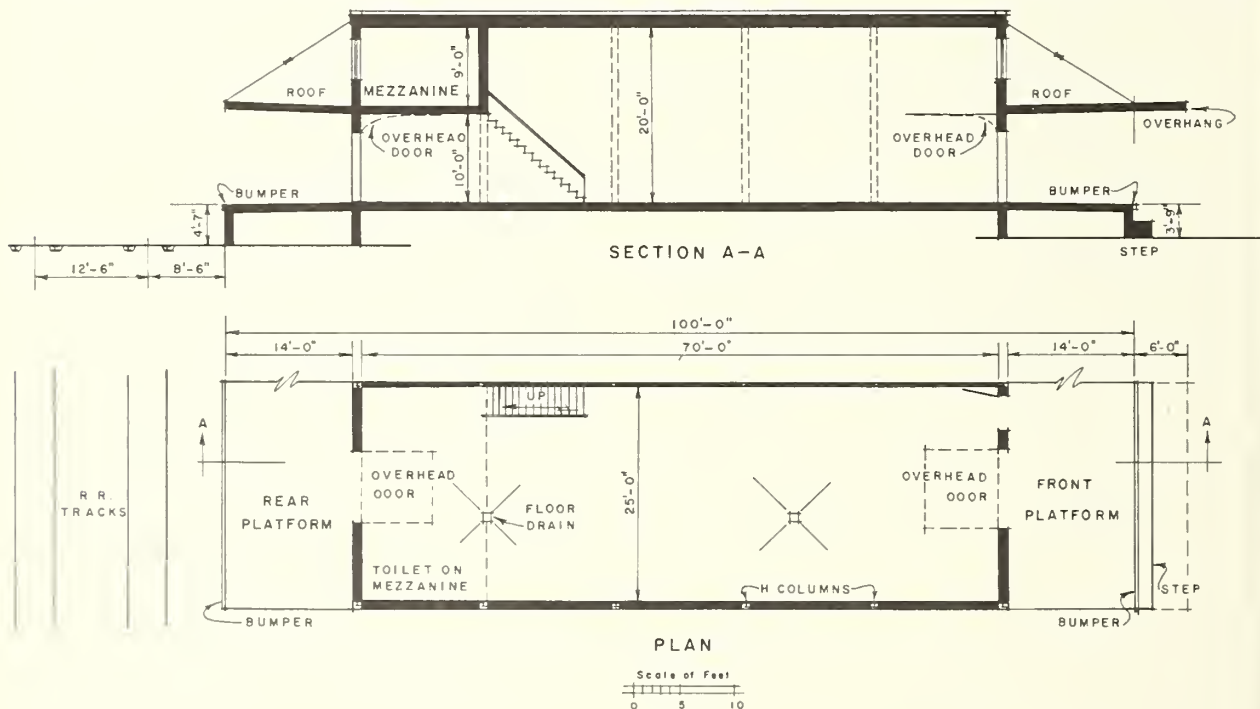


FIGURE 19.—Suggested plan for a standard unit in a multiple-occupancy building.

occupancy building in which the interior plans are modified to meet specific operations. The standard unit shown in figure 19 is 100 feet from

of both platforms to act as an impact buffer.

A continuous step at about half the height of the front platform has been suggested in facilities for

¹⁹ Inventory turnover rates for the food groups mentioned vary and are dependent primarily on the methods used in sales, storage, and distribution. The variations are close to the stated rates; see references (1) and (5).

²⁰ Building designs, site layouts, and construction cost estimates for the complete publication were coordinated or developed by A. B. Lowstuter, architect, Marketing Facilities Planning Staff, Transportation and Facilities Research Division.

other cities. Due to greater use of delivery vans in which a man can stand erect, as opposed to a low panel truck, this continuous step may not be required for ease of loading in the facilities used by some food groups in Pittsburgh. Several of the following sections will not show the continuous step illustrated in figure 20.

extra vigilance is required of flooring contractors and the architect.

All units have specified equipment installed. Heat would be provided by overhead gas heaters in each unit. Such heaters are included in cost estimates. Substitute heating systems are possible with appropriate cost changes. Plumbing in-

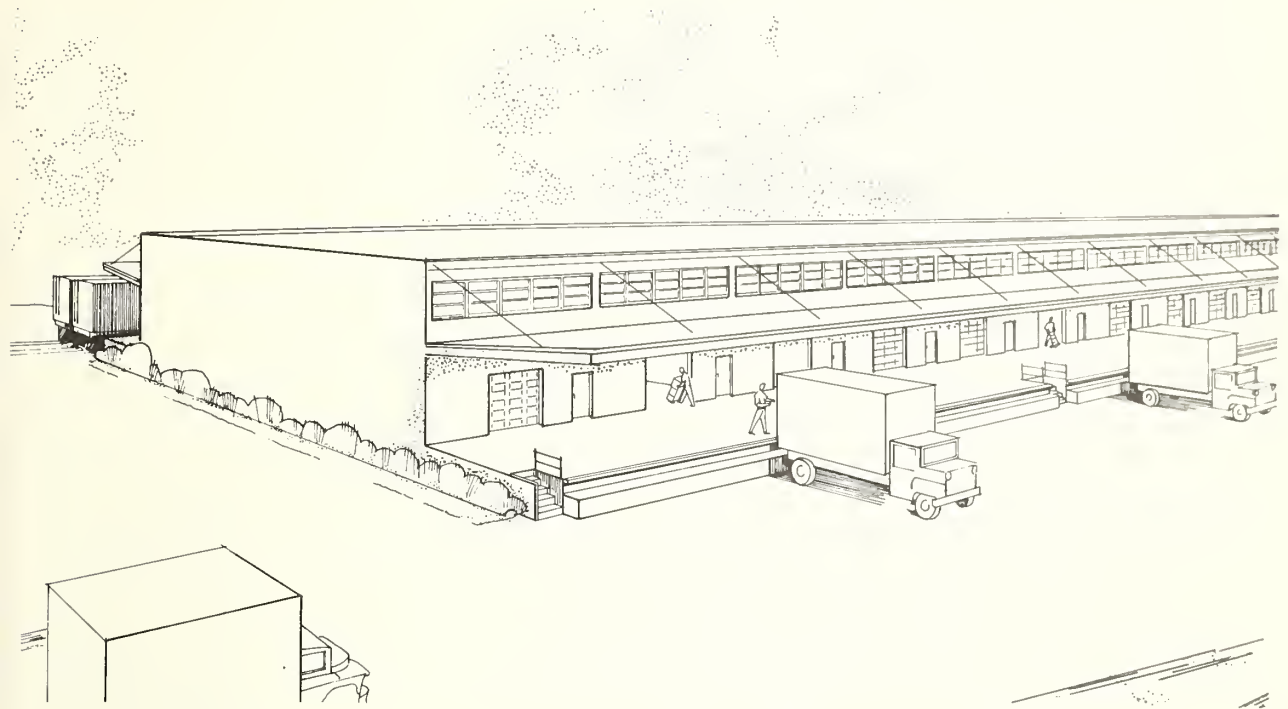


FIGURE 20.—Exterior view of typical multiple-occupancy building.

Steps, or in some circumstances ladders, from the road level up onto platforms should be set into the platform at intervals of approximately 100 feet. The absence of projections in front of the platform eases the street cleaning problems.

The enclosed area of the standard unit has an interior depth of 70 feet. Front and rear exterior walls are each 1 foot thick. The width of each unit is 25 feet on center. The ceiling should be at least 20 feet high to allow pallet stacking or pallet racks. Such a height allows an office mezzanine 15 feet deep across the rear of the unit 9 feet above the main floor. Windows in a mezzanine office make it possible for managers to observe and control most operations on the main floor. Partitions in the building should be removable and waterproof. The first floor, at platform level, should be concrete with a nonskid surface; these floors should be consistently sloped to drains. Improper drainage of the main level has caused operating problems in similar buildings in some cities; thus

cludes a toilet on the mezzanine and a cold water outlet on the main floor. Because of the varying refrigeration requirements of each wholesaler, each firm should plan to install its own refrigeration. The finishing of offices is similarly handled by each firm. The front door opening is 8 feet wide with an overhead door moving into the building or out under the platform roof; a smaller swing-type door (4 feet wide) allows passage of pedestrians and handtrucks without opening the large door. Rear door openings are 8 feet wide with overhead doors or double swing-type doors.

Each standard unit contains 1,750 square feet of enclosed first-floor space, 700 square feet of platform space, and 50 square feet in front and rear walls. The mezzanine has 375 square feet; thus each unit has a total of 2,875 square feet. Variations of the standard unit are described for each commodity group.

One standard unit of a multiple-occupancy building would serve the needs of the small-

volume operators. Larger operators could use two, three, or more such units according to their needs. It is also possible under this arrangement for two operators to lease three units, each having one unit and the two dividing the third.

Fresh Fruit and Vegetable Buildings

The fresh fruit and vegetable wholesalers require 87 units to accommodate 72 firms, and an additional unit will be needed as a restaurant. These units are planned in four multiple-occupancy buildings. Individual-occupancy buildings are provided in the market plan for four firms including banana handlers and vegetable repackers. Food chains could have their produce operations in their general warehouses.

Firms considered as possible tenants of new facilities handled 537,100 tons of fresh fruits and vegetables. The total floorspace planned for fresh fruits and vegetables, excluding food-chain warehouses and the farmers' market area, is 313,680 square feet. Multiple-occupancy buildings will use 220,000 square feet of first floor space and individual occupancy buildings will occupy 93,680 square feet (table 10, p. 42). The total floorspace recommended is approximately 120,700 square feet less than is presently used. This difference is based on the greater efficiency of single-floor operations and the reduction of unused space.

The primary variation of the fruit and vegetable unit from the standard unit of multiple-occupancy building is the increased depth of the front platform. To accommodate quick-moving items and displays, a front platform 24 feet deep is provided. The larger platform causes a decrease of interior depth to 60 feet. Thus, the enclosed space is 1,500 square feet (60 feet by 25 feet on center), and the platform space is 950 square feet.

There should be two parallel rail tracks adjacent to the rear platform. The track next to the building will be the normal house track. The outer track should be used as an access track to buildings farther along the siding. During times of heavy rail receipts, the track could serve as a second house track or team track. When unit locations are assigned, consideration should be given to interspersing wholesalers who receive large quantities by rail with those who receive a few such cars so that best use of house tracks can be attained.

Farmers' Market Area.—A shed type of structure containing 60 stalls should be provided for the immediate needs of 75 local growers presently located in the North Side Farmers' Market. Open stalls should meet the requirements of other

growers and seasonal peaks. As described earlier, this group must relocate due to redevelopment of the North Side.

The suggested prefabricated structure is 300 feet long and 42 feet wide without a platform (fig. 21). The ground surface would be covered with an asphalt-concrete combination, sloping sufficiently to drain to the outer edges of the shed. Two restrooms have been added at the end of the shed. Stalls on both sides of the shed would be 10 feet wide with a buyers' aisle 10 feet wide between them. Main entrances and exits would be at the ends of the shed; side exits would be between parked trucks. Farmers' trucks would be able to back 6 feet under eaves, which are 14 feet above the pavement level, so that tailgates would be out of the weather. Assuming that the farmers' market functions would be similar to existing practices, produce could be displayed on portable sales tables that are removed after each evening's sales. During the day, the shed would be available for sheltered parking. Transfers of wholesale quantities would be made in tailgate-to-tailgate fashion in the parking area during specified hours.

Both open and covered stalls could be managed by the farmers' association, which presently administers the North Side Farmers' Market.

Meat Buildings

To accommodate 26 meat processing and wholesaling firms, 32 units are planned in 2 multiple-occupancy buildings. These units are designed for use by moderate volume processors, purveyors, and general wholesalers. Also included are firms that operated meat docks for delivering meat from preassembled orders received from out-of-town packers; these operations might be effectively accomplished by assembling orders and holding them briefly in refrigerated units. If the operation is a direct transfer from long-haul vehicle to delivery truck, this could be accomplished in tailgate-to-tailgate style. Five individual-occupancy buildings provide space for two meat processors and three meatpackers.

Firms considered as possible tenants of new facilities handled approximately 108,800 tons of meat and meat products. The main-floor space required to handle this volume is 653,750 square feet. The recommended space is approximately 350,400 square feet less than is being used in existing facilities. Nearly 80 percent of the difference is in more efficient use of space; the remaining 20 percent is represented by firms not expected to relocate.

Suggested units for meat will have two full

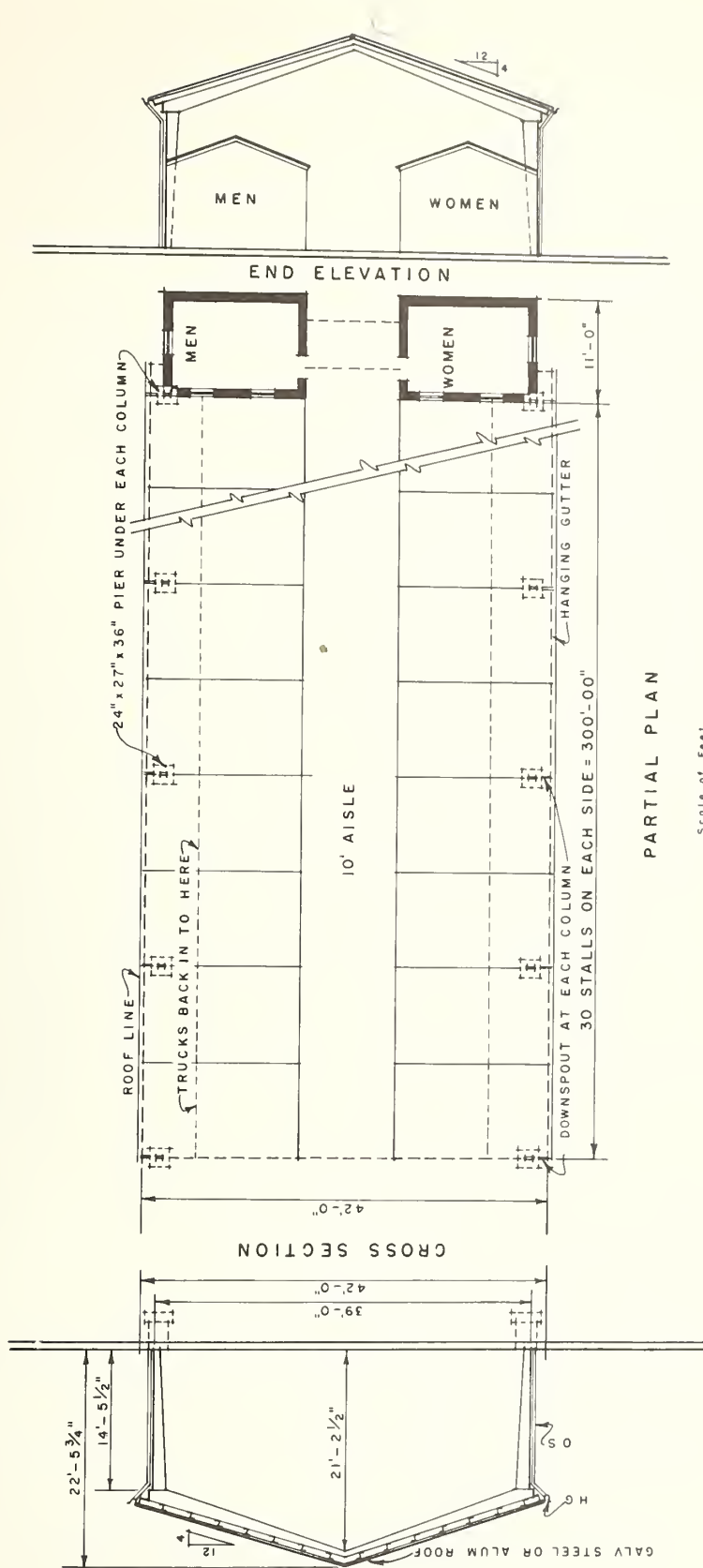


FIGURE 21.—Suggested plan for the farmers' market.

floors, as shown in figure 22. Each unit's main floor (all meat operations) will be 25 feet wide. With platforms of 14 feet on the front and rear, the interior length is 70 feet with a ceiling 12 feet high. The entire main floor could be refrigerated by either individual unit compressors or a central system for each building. The refrigeration source would depend upon the builders' engineering recommendations.

along the full length of front and rear platforms with switches and scales at each unit, thereby making it possible to unload and load carcass meat at any point on the platforms and roll the meat to and from all units. Each wholesaler could join his individual meat rail system into these rails and thus have direct rail transfer of meat from rail cars or trailers. Interior arrangements for a service wholesaler's layout may differ from those shown

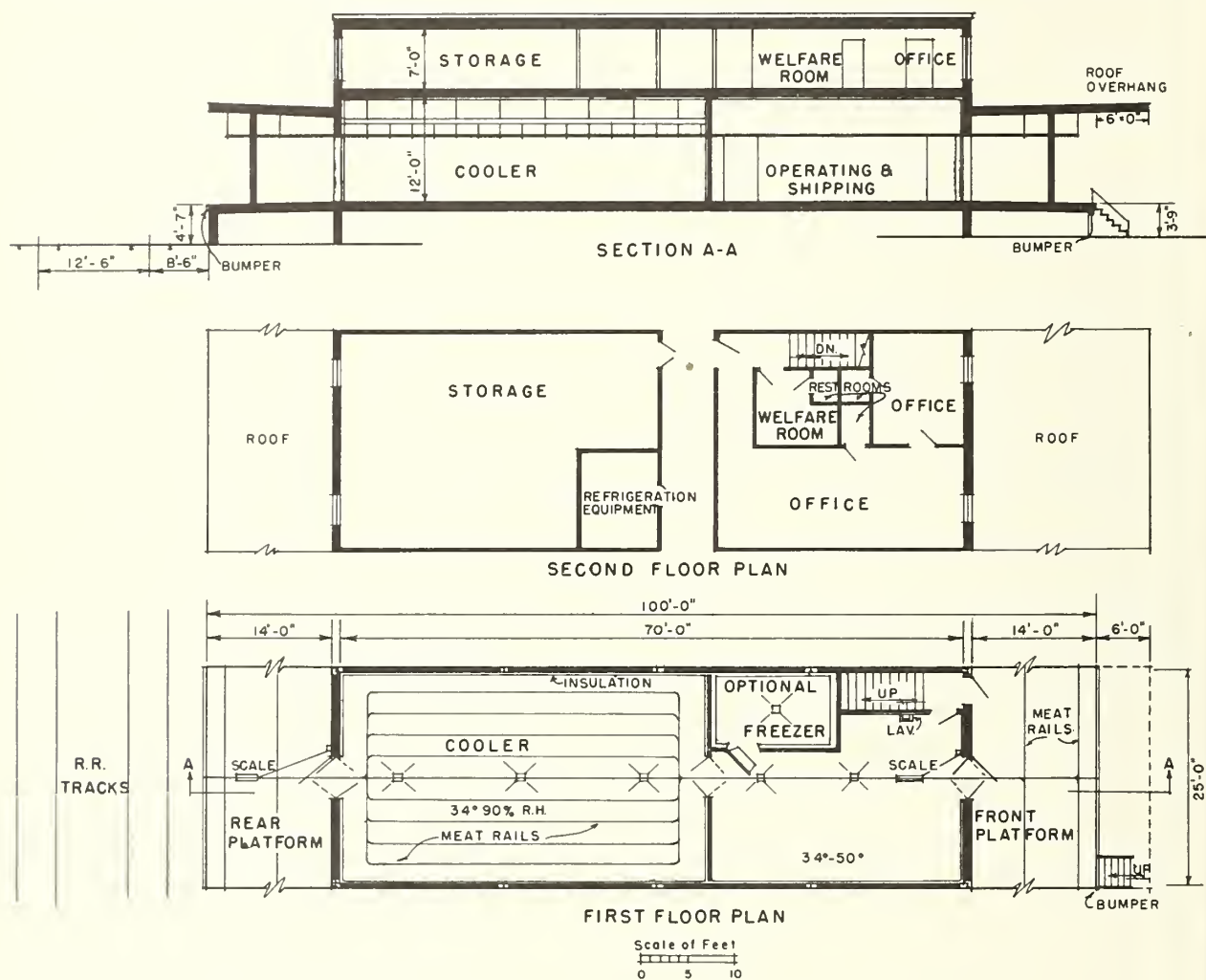


FIGURE 22.—Suggested plan for meat and meat products.

Metal steps to the platforms are extended into the paved area because the indented stair well would interfere with men pushing meat on the overhead rails. Guard posts should be placed slightly in front and to the side of these stairs to lessen damage from trucks, which may accidentally back into the stairs.

Doors on the front and rear of the unit are 5 feet wide. Two meat rails should be constructed

in figure 22 because of the work the wholesaler performs. All interior materials should be impervious and easy to clean. Specific requirements for all phases of construction are presented in two publications of the U.S. Department of Agriculture (23 and 24).

The second floor of the multiple-occupancy buildings contains offices over each unit, a dry storage area, a central connecting hall, a cooperatively

provided meat inspection office, and a personnel welfare room. A freight elevator (10 feet wide and 10 feet deep) would be provided at the non-expandable end of each building. Allowance should be made for another elevator when the expansion is completed. If individual unit refrigeration is used, compressor equipment would be in the dry storage area. If meat products are handled on the second floor, specific conditions will have to be approved by the Meat Inspection Division of USDA.

Double house tracks should be placed at the rear of both buildings. The outer track is used primarily for moving rail cars to buildings farther along the siding, but it can be used as a second house track when necessary.

Processed-Poultry Building

Part of a multiple-occupancy building could accommodate five poultry wholesale firms with five units. Obviously, these units will not handle all the processed poultry moving through Pittsburgh area facilities; the remaining poultry is handled by meatpacker-distributors, egg firms in other facilities, and chainstores. Firms considered as possible tenants in the multiple-occupancy building handled 6,200 tons of processed poultry. The total floorspace required is 25,500 square feet.²¹

Operations in these units consist of short-time holding of fresh icepacked poultry for wholesale delivery to retail establishments and institutions. Also, cutting operations for some orders must be done in these units. At present no large-scale operations (that is, killing and dressing) are expected; however, several kosher poultry operations with small killing areas may be required. Most firms will have freezer capacity for a part of their poultry volume. Interior layout of units is the responsibility of each firm, and such layouts should consider requirements of the county health department and possible Federal inspection requirements on cutting operations.

The poultry units will be in a multiple-occupancy building with egg wholesalers. These units vary from the previously described standard unit in that the mezzanine office is on the front and the units are 30 feet wide (fig. 23). Such an interior design allows a second-floor processing and storage area (9). Particular attention should be given to drains and floor slope to take care of the water from melting ice used in packing poultry and cleaning operations. No house tracks to the poultry units are required because products arrive by truck.

²¹ Comparisons of square feet in present and proposed facilities cannot be shown because it could reveal confidential information.

Grocery and Food-Chain Warehouses

Both individual buildings and multiple-occupancy buildings are necessary to accommodate 26 firms that require modern grocery facilities. The master plan for the market includes areas for 4 food-chain warehouses, with over 200,000 square feet each of first-floor space, 2 individual wholesale grocery buildings with approximately 30,000 square feet each, and 40 units in 2 multiple-occupancy buildings totaling 115,000 square feet. The total grocery volume handled by these firms is 586,800 tons. Grocery units in multiple-occupancy buildings vary from the standard unit in several aspects. Most firms will require two or more units; the layout in figure 24 shows the typical double unit. The rear platform, 14 feet deep, can be used for receiving shipments in one vehicle for several wholesalers; the common platform allows easy access to all firms. The front platform of the standard unit is modified by enclosing the area and using it for product assembly. The mezzanine office, 14 feet deep, is placed over the enclosed front platform. The storage area in grocery units should have at least 20 feet of clear stacking height.

Operating conditions in grocery units are different from units designed for fresh foods. Because of a lower inventory turnover rate for grocery items than for fresh products, the average annual tons per square foot of space is lower.

Grocery facilities do not require floor drains, which are necessary in facilities used by other food groups. With no requirement for processing operations, heavy-duty power cables and large water pipes are not required in multiple-occupancy grocery facilities. Therefore, construction costs and rentals for these buildings can be lower than for buildings for other food groups. Such lower costs are necessary to attract grocery wholesalers to centralized food facilities.²²

Buildings for Manufactured Dairy Products and Eggs

One individual building and 23 units in multiple-occupancy buildings are proposed to accommodate 19 wholesalers that handle approximately 39,000 tons of manufactured dairy products and eggs. These two multiple-occupancy buildings would be used by a combination of poultry and egg wholesalers, dairy products and egg wholesalers, or specialists in any of these com-

²² Grocery requirements and recommendations were reviewed by W. C. Taliaferro, industrial engineer, formerly with the Marketing Facilities Planning Staff, Transportation and Facilities Research Division.

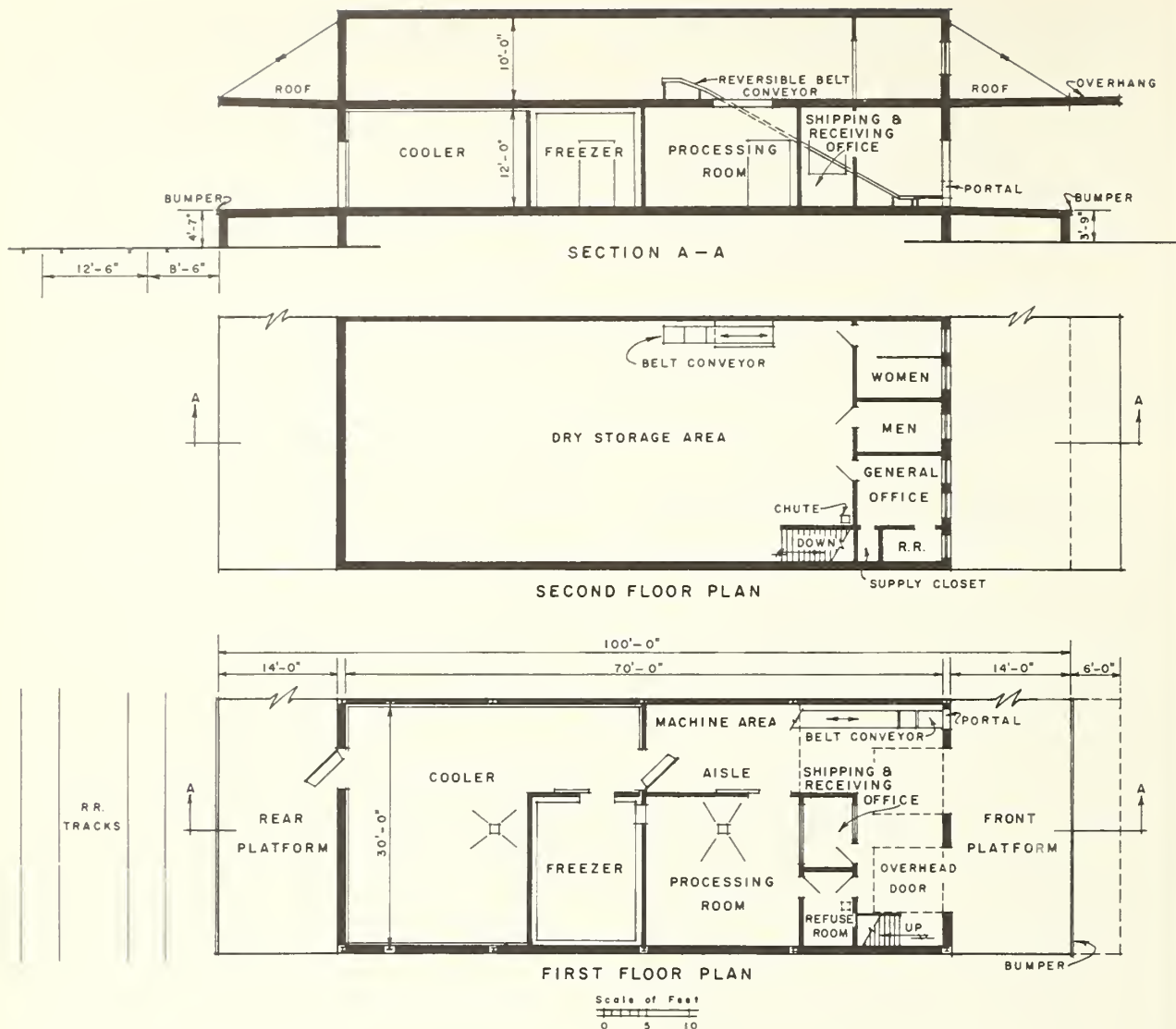


FIGURE 23.—Suggested plan for a processed-poultry unit.

modities; reference to the master plan will show probable grouping within the two buildings. Firms expected to use proposed facilities would require approximately 113,600 square feet of space.

The suggested interior plan for units in multiple-occupancy buildings is similar to units used by processed-poultry wholesalers. Units are 25 feet wide and a second floor would not be necessary initially (fig. 25). The processing area would include packing operations, and the area over the refrigerated rooms could be used for storage of cartons and similar items. This unit is planned for less processing than the wider poultry units. A single house track is provided along the rear platform.

Frozen Foods Buildings

Frozen food wholesalers are expected to require 3 individual buildings totaling 58,000 square feet and 8 units in a special purpose (low temperature) multiple-occupancy building of 75,000 square feet. Such facilities will accommodate 9 firms distributing over 29,000 tons of frozen foods within the 31 counties. The 133,000 square feet of space proposed for frozen foods may appear to be excessive; however, this could accommodate the more than 15,000 tons of frozen foods that are held in storage in local facilities and not owned by local wholesalers. This latter volume is in addition to the frozen food distributed in the area. If privately owned facilities that were being planned for

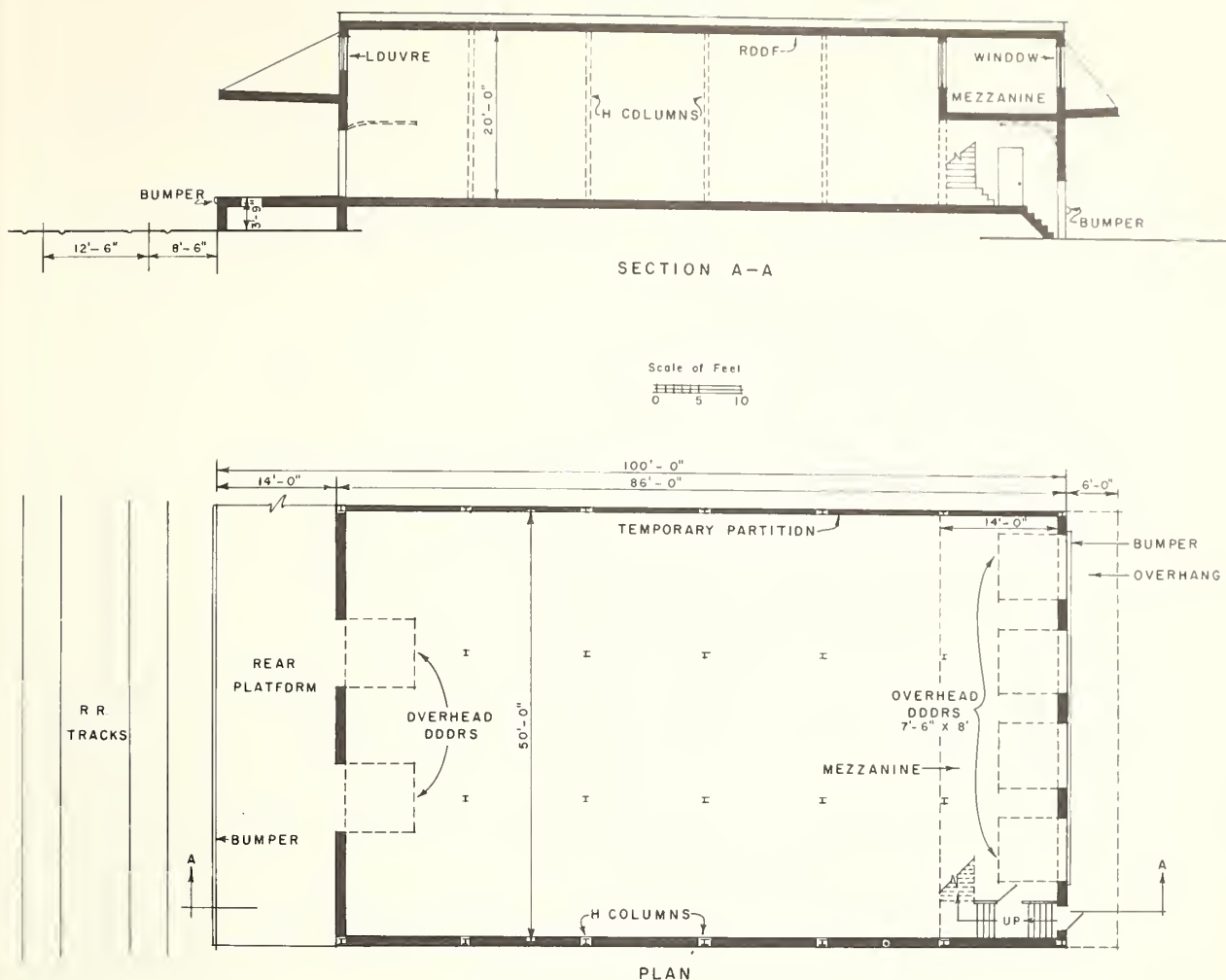


FIGURE 24.—Suggested plan for a grocery unit.

frozen food during this study are constructed, the proposed square footage should be reduced.

The multiple-occupancy buildings (300 feet long and 250 feet in depth) for frozen foods are unlike the other multiple-occupancy buildings, because a large public storage area, which can receive simultaneously by rail and truck, is accessible to all units (fig. 26). This arrangement allows greater flexibility in operations because it permits the use of a general storage area by several firms for greater economy. The suggested plan assumes that order assembly operations will include case splitting within each unit; these order assembly areas are $37\frac{1}{4}$ feet by 70 feet. If case splitting for orders is accomplished in delivery trucks, a slightly different interior arrangement could be considered.

Mezzanine offices ($37\frac{1}{4}$ feet by 20 feet) would be located on the front of the building. A front platform 16 feet wide and common to all units would

be 45 inches above the paved surface. This platform could be refrigerated, if required. It would have a roof that overhangs 6 feet to protect loading and unloading operations from bad weather. The rear entry from rail car or truck would be directly into the public storage area without a common platform; however, the entry door would be 55 inches above the rails to accommodate refrigerated rail cars. The interior of the public storage area and the units should be at least 18 feet high except under the mezzanine office in the order assembly area.

Fishery Products Building

One multiple-occupancy building with 10 units will be required by 9 wholesalers handling an estimated 11,700 tons of fresh and frozen fishery products. It is planned to handle this volume in 35,000 square feet of first-floor space by stacking on pallet racks. Such handling practices reduce

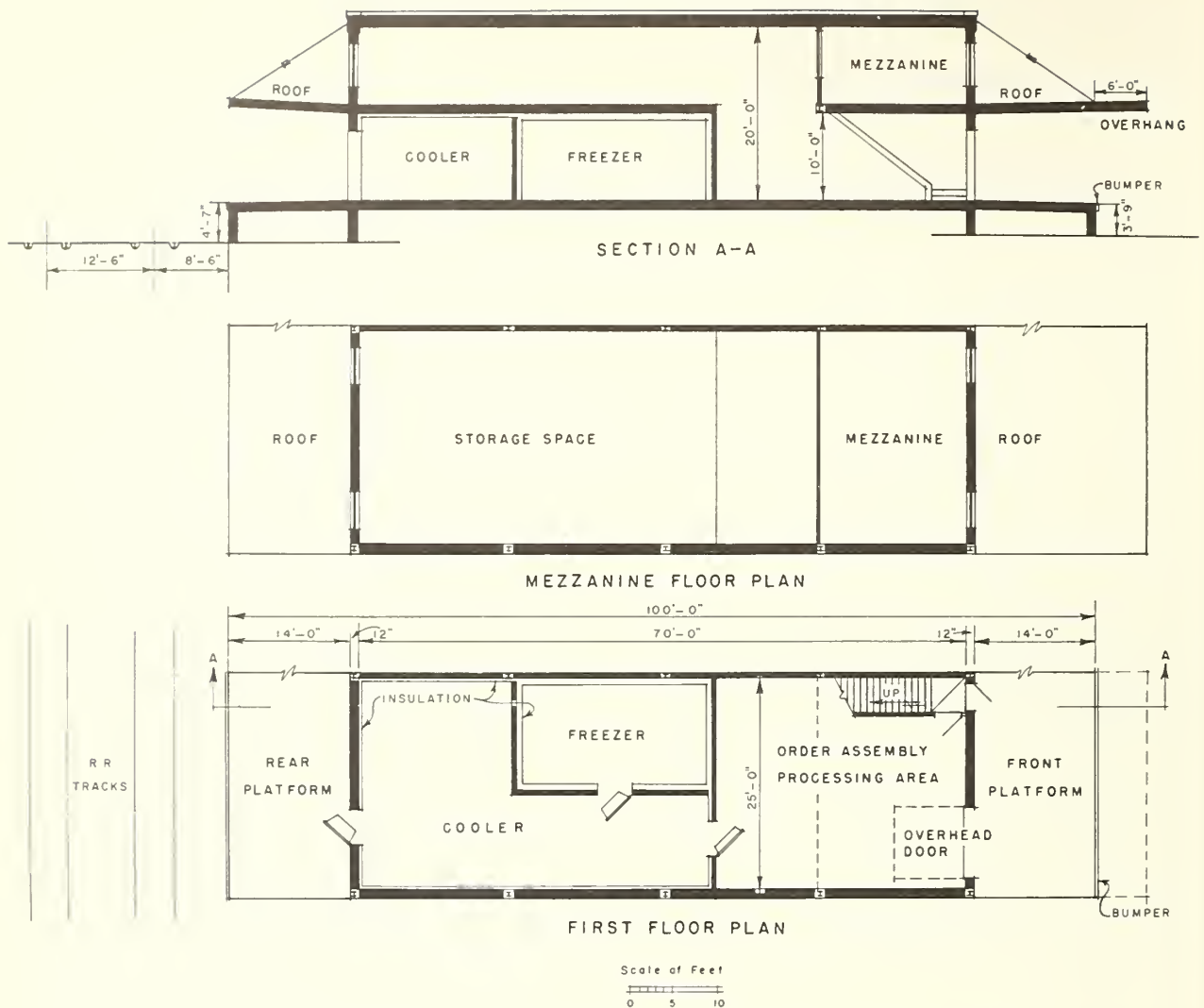


FIGURE 25.—Suggested plan for a unit for manufactured dairy products and eggs.

space requirements by about 70 percent of the space used at the time of this study.

Each unit will be 100 feet by 35 feet on centers, 10 feet wider than the standard unit; these dimensions are required for an efficient layout adaptable to the average ratio of frozen to fresh products, the size of packages, and a modern materials-handling system. Each unit will have 2,450 square feet of enclosed first-floor space and 980 square feet on both platforms. Ceiling height should be at least 20 feet to allow pallet racks. An office mezzanine 15 feet deep with 525 square feet is located over the processing and order assembly area on the front of the building. Because of the large volume of water used in processing, particular attention must be given to slope to floor

drains and location of plumbing. The layout of this unit is shown in figure 27. A single house track would be sufficient for the small volume received by rail; this track would serve as lead-in track to other facilities.

Floorspace in the Proposed Food Distribution Center

The master plan for the proposed food marketing center provides for 19 individual-occupancy buildings totaling 1,833,430 square feet of first-floor area and 211 units in 12 multiple-occupancy buildings, totaling 582,000 square feet of first-floor area. A grand total of 2,548,280 square feet of first-floor area will serve seven food groups. An expansion area of approximately 20 percent is pro-

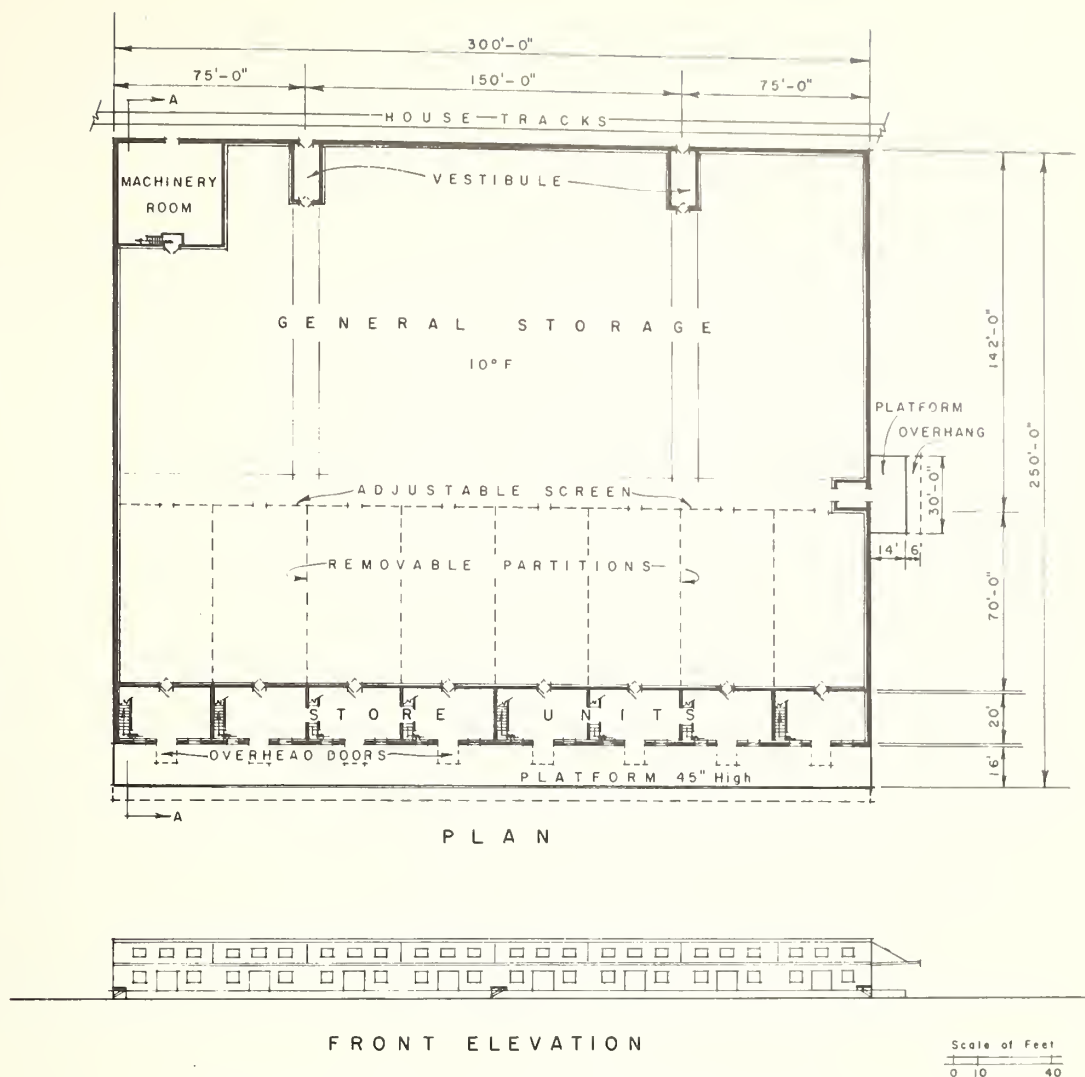


FIGURE 26.—Suggested plan for a frozen foods building.

vided for additional units to serve the growing population within the distribution area. Table 10 shows the space proposed for each food group.

Rail Connections to Buildings

In the master plan, house tracks are provided to all buildings except processed poultry wholesalers and some egg firms that do not have any rail receipts. Double tracks are located at the rear platforms of all buildings with rail receipts, except fishery products, manufactured dairy products, and eggs. Where there are two tracks, the outside track is usually for access. When rail receipts are heavy, rail cars could be placed on the outside track, and they could be unloaded through a car on the inside track. In addition, the outside track could function as a team track.

The streets at the rear of most multiple-occupancy buildings should be paved between and level with the top of the rails. This permits the rear platforms to be used in loading or unloading trucks when the tracks are not occupied. Such paving also allows easier cleaning.

Streets and Parking Areas

Since it is presumed that connecting highways between present and proposed major arteries and the market area are to be provided by the city or county, such highways are not computed in the cost of the market. Access highways with proper drainage and grading are estimated by the city of Pittsburgh to cost from \$300,000 to \$2 million, depending on the site chosen for the market center. The major streets in the food distribution

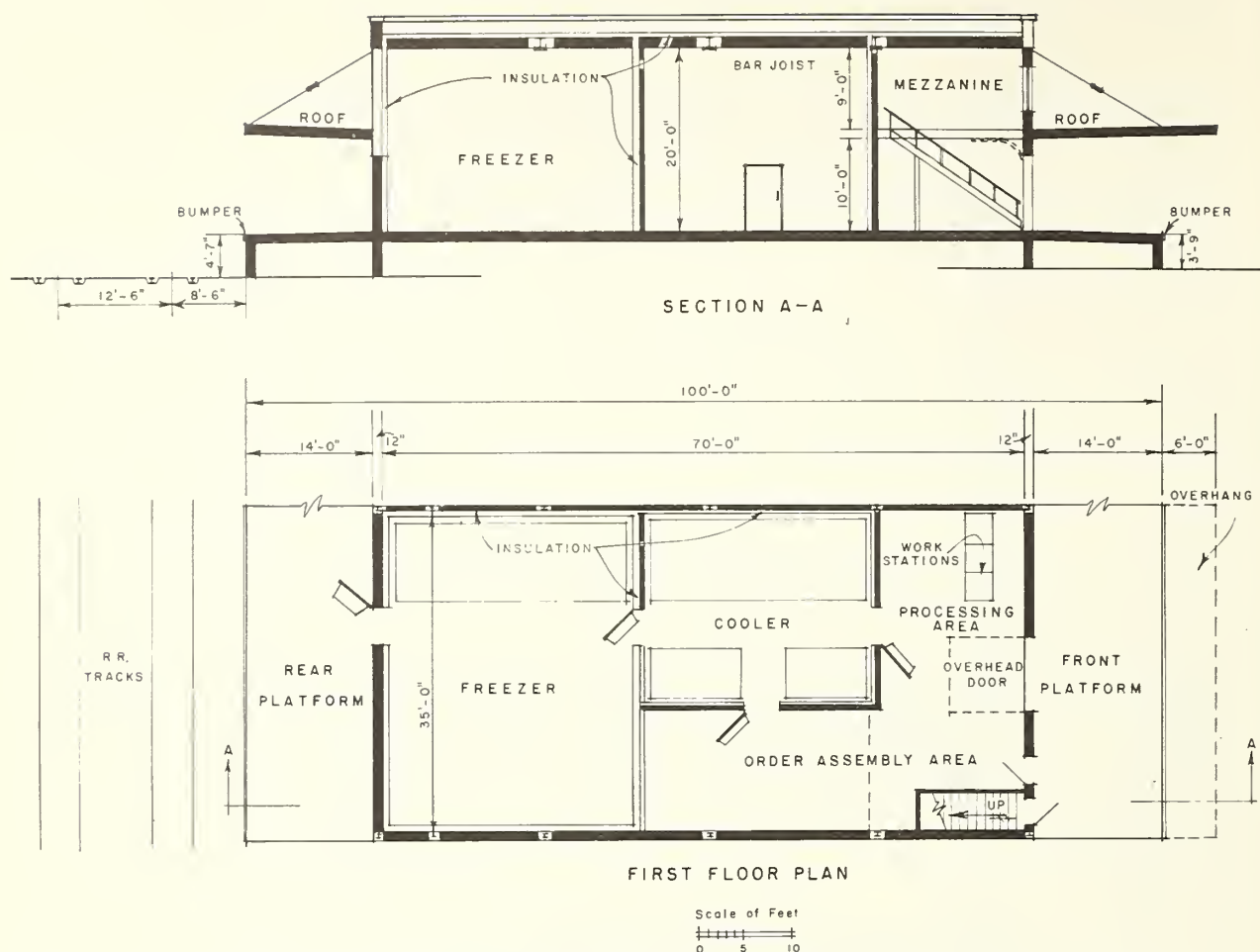


FIGURE 27.—Suggested plan for a fishery products unit. (Coordinated with C. P. Hoffman and J. W. Slavin, Bureau of Commercial Fisheries, U.S. Department of the Interior.)

TABLE 10.—Estimated floorspace in proposed wholesale food marketing facilities

Food group	Multiple-occupancy buildings		Individual buildings ¹	Total
	1st floor	Mezzanine or 2d floor		
	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>
Fresh fruits and vegetables ²	220, 000	33, 000	93, 680	346, 680
Meat and meat products	80, 000	56, 000	573, 750	709, 750
Poultry	15, 000	10, 500	0	25, 500
Groceries	100, 000	15, 000	1, 060, 000	1, 175, 000
Manufactured dairy products and eggs	57, 000	8, 630	48, 000	113, 630
Frozen foods	75, 000	4, 470	58, 000	137, 470
Fishery products	35, 000	5, 250	0	40, 250
Total	582, 000	132, 850	1, 833, 430	2, 548, 280

¹ The amount of mezzanine office space required will vary with the requirements of the individual firms.

² These figures do not include the farmers' market shed, which is a different type of structure.

center should be paved to carry heavy traffic and to facilitate water drainage away from the buildings. The costs for streets and parking areas within the market are included in paving costs shown later for each food group. Paving consisting of a 7-inch rock and gravel foundation, 4 inches of macadam, and 2 inches of asphaltic concrete surface was assumed.

All parking at the buildings should be at right angles to the loading platforms. Where two rows of buildings face the same street, and center parking is planned, the streets should be approximately 200 feet wide to provide for parking of trucks at right angles on each side of the street, center parking, and sufficient space for the flow of traffic. Other streets might vary from 60 to 100 feet, depending on their use and the traffic load. In some places it would be necessary to provide angle parking for cars and trucks, while in others only sufficient space to handle traffic would be needed.

Convenient parking spaces should be provided near the stores for vehicles that are not actually being loaded or unloaded. Such parking areas would be used for parking trucks bringing in supplies, those that are not ready to unload, buyers' cars and trucks coming to the food center for supplies, and employees' cars. The parking areas should be as near the buildings as possible, but should not interfere with market streets or loading areas. They should be marked off to permit orderly parking and to conserve space. Parking space for about 2,400 vehicles has been provided for buyers, wholesalers, and employees' car pools. These parking requirements are based on usage during this study. This parking is in addition to truck spaces along store platforms.

Service Facilities and Allied Industries

Certain other service facilities within the market are necessary or desirable. One fruit and vegetable multiple-occupancy building has a second floor for offices for 30 brokers, unions, Federal and State agencies connected with the market, market management, and an auction room. Such office and auction space can be built most economically as the second floor of a multiple-occupancy build-

ing centrally located in the food center. The actual number of offices should depend upon signed leases at the time of construction. Estimates for this report were based upon the occupants of office buildings near food wholesaling facilities who would not be accommodated in mezzanines and in individual buildings.

Two public restaurants are shown on the master plan in multiple-occupancy buildings. Public restrooms with entrances from the street should be located in the basement of these two dining facilities.

Although a detailed study of allied industries was not an integral part of this study, a relatively large area has been set aside for development and relocation of such industries. This large area was suggested from observations of the poor operating conditions for allied industries near present food marketing areas. Possible allied industries include a bank, motel, communication center, data-processing center (inventory control and accounting system), truck service station (with public scales), trucking firm, farm equipment and supplies (basis of return loads), food laboratories, ice plant, canners and processors of frozen and dried foods, chain restaurant commissaries and kitchens, industrial food catering, large bakeries, confections, coffee roaster, food containers, packaging, and cooperage, general food warehouses, soft drink bottling, and rendering plants.

Close physical proximity—the industrial park concept—has economic justification in locating the wholesalers and processors for the food industry. Factors to support this concept are many. (1) Most operators need railroad service, and they can obtain better service as a group. (2) All operators need good highway access. (3) Low-priced land is required for the single-level buildings, which yield greater savings in efficiencies. (4) All operators need many of the common services previously listed. (5) Many wholesalers and processors require an exchange of products with each other. This is becoming increasingly noticeable in the specialized preparation of convenience foods. (6) Lower costs per operator can be attained by having firms together.

Facilities Arrangement and Acreage Required for the Proposed Center

The 12 multiple-occupancy buildings and 19 individual buildings required by food wholesalers must be arranged so that marketing functions can be performed efficiently. A master plan for the market must be designed and continually followed.

Wholesalers handling similar commodities should be grouped together to facilitate construction and management and to save time in assembling foods. Each food group's area should be so located that traffic problems will be minimized. Space for ex-

pansion of facilities should be available adjacent to each group of wholesalers. Buildings of similar size and shape should be alined to avoid wasting space. Facilities requiring house tracks should be as close as possible to the lead-in point from the main rail line, and track arrangements should facilitate rail operations. Streets should be laid out to make through movement easy and wide enough to allow trucks to maneuver; yet space must not be wasted. Primary highways should connect with the site. Parking should be close to the facilities served, but it should not interfere with handling functions.

A Recommended Site Arrangement

The recommended arrangement of facilities on one of the sites discussed later (Chartiers site) is shown in figure 28. This layout is shown without intending to prejudice the selection of any other site; it could easily be adapted to any satisfactory site. Arrangement on a possible site enables the demonstration of layout principles with definite reasons for a specific arrangement.

Market streets on the Chartiers site are alined to connect with the primary highway on the eastern edge of the site; a nonarterial road connects all market streets on the western periphery. Streets with double parking in the middle are at least 200 feet wide.

Fresh fruit and vegetable wholesalers in multiple-occupancy buildings will have the heaviest traffic; therefore, they are located near the primary entry point of the marketing center. This practice avoids unnecessarily heavy traffic moving past wholesalers in other commodity groups. While livestock slaughtering operations are located on one side of the area, other meat wholesalers are grouped closer to the other commodity operations for ease in assembly. Frozen-food handlers are placed in an area where a modern public refrigerated warehouse could be located for economical handling of stored products. Multiple-occupancy buildings are placed together, and buildings for individual occupancy are grouped in another part of the area. Since food-chain warehouses will not have buyers coming to their locations, they are located away from the other wholesalers. The location of the farmers' market on the edge of the Chartiers site closest to the city requires little penetration of the market by small-quantity buyers. Operating hours for this farmers' section should be in the evening; thus there will be no conflict with other market traffic.

An expansion area is provided adjacent to each food group using multiple-occupancy buildings.

Occupants of individual buildings could expand into space adjoining each building. The allied industries area is located at one end of the site and can be developed at a different time from that of the rest of the market. Such an expansion policy retains the homogeneous grouping of firms to minimize intramarket transfer costs.

The rail approach is from the northeast corner nearest main lines, which are along the Ohio River. Such rail alinement allows for gentle curves into the food center's house tracks, but is objectionable in that it crosses all market streets at the points where they enter the primary highway. These gentle approach curves coincide with the natural boundaries; thus land is not wasted on rail approaches. The grade of the rail approach into the site is an important factor, considering the roughness of the terrain and the need to level the site. Except for the terrain problem it would be better to build the house tracks from the west side of the property. The house tracks can be used for direct unloading into trucks from the street side. The inner track on the Chartiers holding yard approach (north boundary of the site) also has team track capabilities, but it is doubtful that they will be required.

Layout of Other Possible Sites

Figures 29 and 30 show layouts on the Moon Township and Strip area sites using the principles that have been explained. Due to the shape of the land parcels, the arrangements on these sites must be altered. No farmers' section is shown on the Moon Township site, because it is too far from the city to draw the retail buyers.

Stages of Development

Regardless of the site that is selected, not all facilities are expected to be developed at the same time. The creation of a complete wholesale food marketing center and its allied industries area is an operation that will require considerable time. Therefore, reasonably self-sufficient sectional development, like an industrial park, is desirable. For example, the fresh fruit and vegetable industry should be relocated in a single stage to retain the interactions of the market. However, individual chain warehouses would be expected to relocate whenever their volume and costs become too great for existing facilities. Such times of relocation for all food groups can differ by as much as a decade.

When an area for new facilities becomes available for construction, it is expected that the city and county will become more vigorous in enforcement of existing health and traffic regulations.

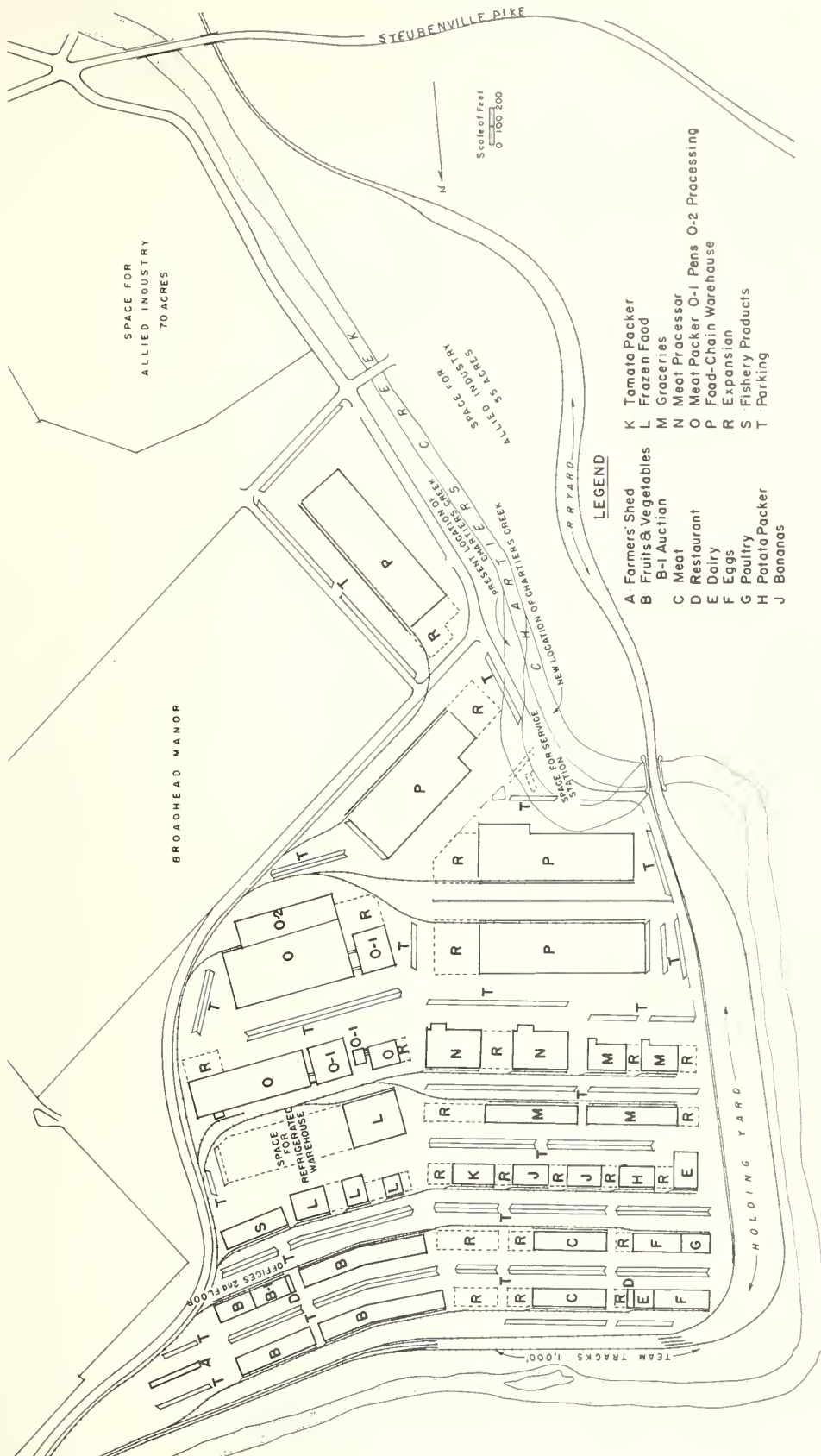


FIGURE 28.—Arrangement of proposed facilities on the Chartiers site.

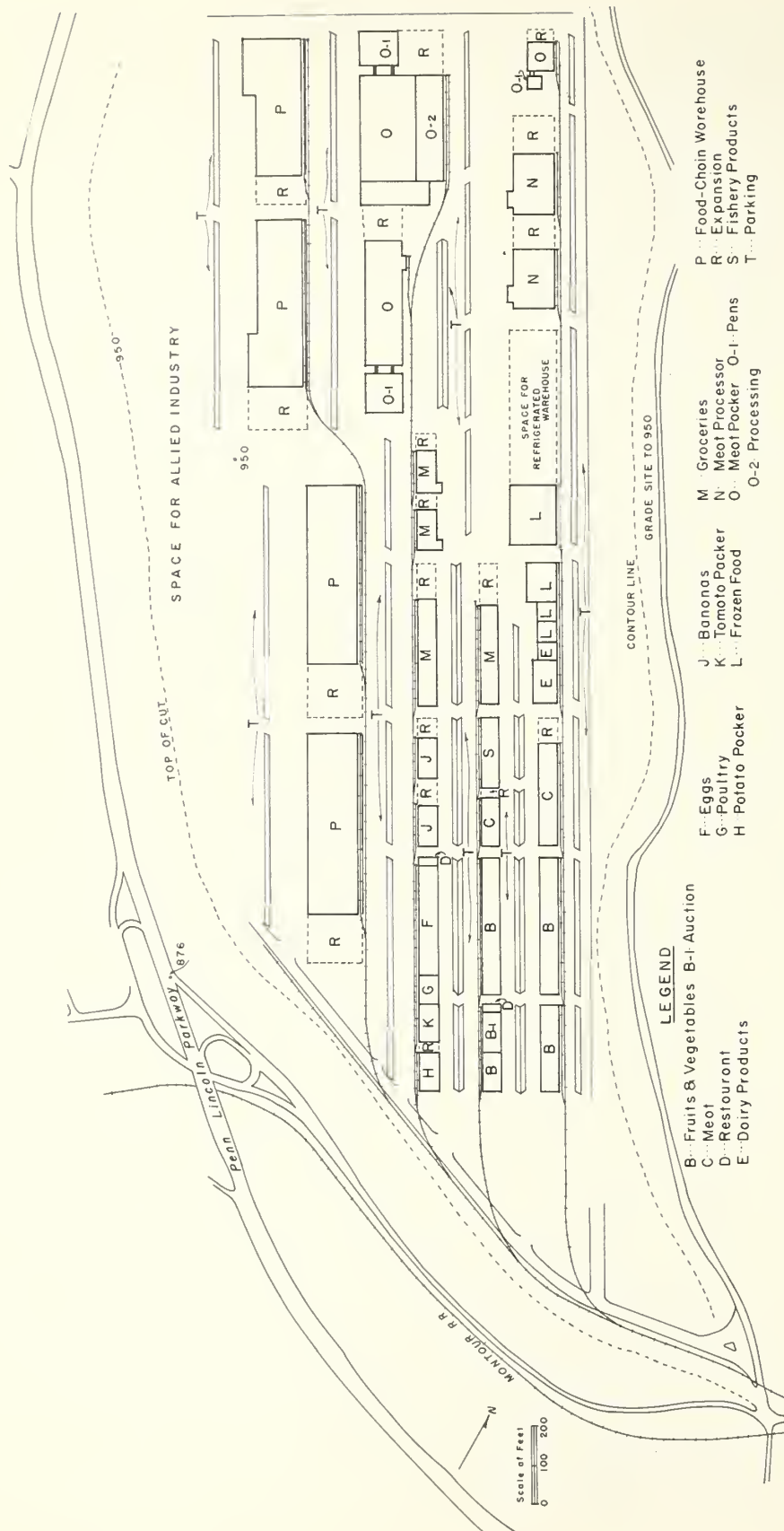


FIGURE 29.----Arrangement of proposed facilities on the Moon Township site.

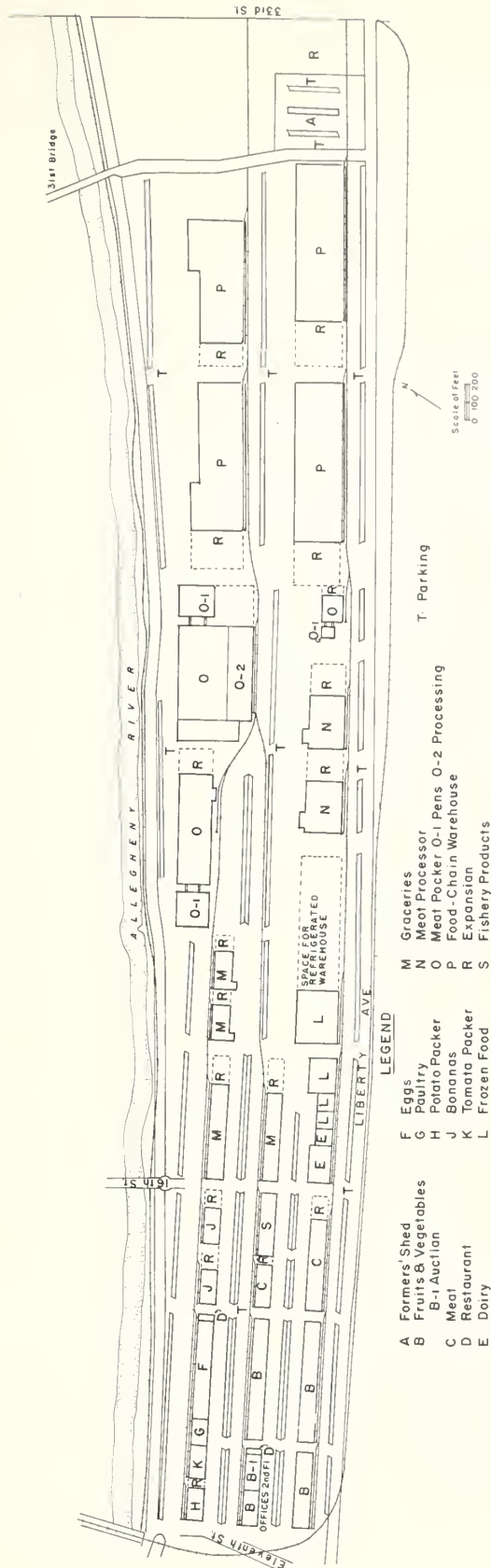


FIGURE 30.—Arrangement of proposed facilities on the Strip site.

Such encouragement combined with economic motives should start the first stage.

Even though space is suggested for them, allied industries are not within the scope of this report. Such industries are interested in new facilities for at least two reasons: (1) They are allied to the operations of food wholesalers, and can offer better service if their location is close to the food operations. (2) And some are faced with problems of relocation and need for more efficient structures.

Acreage Required

The exact acreage required for the proposed wholesale food facilities and allied industries could vary, depending upon the shape of the site.

Selecting a Site for the Proposed Center

The four groups primarily concerned with the location of a new food marketing center are wholesalers who will operate in the facilities, buyers who will use the market, sellers who will send commodities to it, and agencies providing services for the market. In choosing a site for the center, the principal factors to be considered are (1) convenience to retail outlets, (2) direction of population growth, (3) adequate land at reasonable cost, (4) accessibility to truck transportation, (5) accessibility to rail transportation, (6) accessibility to public utilities, (7) avoidance of nonmarket traffic, and (8) land use, topography, shape of tract, and zoning. To coordinate these factors, the cooperation of many local agencies is required, such as area planners, traffic control, highway departments, railroads, redevelopment agencies, and similar public service groups.

Convenience to Retail Outlets

It is essential that a wholesale food distribution center be located as closely as possible to a point where a minimum of time is required to deliver to retailers or for retail buyers to reach the market, obtain their supplies, and return to their establishments. Thus, the ideal market site would be as near as possible to the center of retail distribution.

Approximately 95 percent of the 1.4 million tons of food distributed by Pittsburgh wholesalers in the year studied remained in the previously described 31-county area. Because independent stores, food-chain stores, and local restaurants are important distribution points, their locations and the volume moving to these points were studied in establishing a central distribution point of retail outlets. This center is located so that as much ton-

For the purposes of this report, the 345 acres shown for food wholesalers and allied industries on the Chartiers site is used in all comparisons. The acreage requirement is derived by combining the necessary space for facilities in each commodity group, including building area, streets, parking area, and expansion area.²³ The space required by food wholesalers is approximately 220 acres. An additional 125 acres would be available for allied industries. Failure to acquire adequate land for all associated market activities can result in unnecessarily high operating costs for the facilities or increased expenses in future expansion. The best environment for efficient marketing involves grouping facilities in the same general area.

nage moves north of the point as moves south, east, or west of this center of distribution. In the study year the center of distribution was near the Golden Triangle, as shown in figure 6.

Direction of Population Growth

According to the 1960 census, the population of the 31-county area was approximately 4.8 million, an increase of 7.5 percent since 1950. Allegheny County, the largest county in the distribution area, has a population of approximately 1.6 million, an increase of 7.0 percent since 1950. Such a percent of population growth was less than half of the U.S. average for that period.

The centers of population for the distribution area during the census years 1940, 1950, and 1960 were in Allegheny County, as shown on figure 31. These population centers are west of the Golden Triangle, and they establish a line nearly parallel to the proposed Washington-Warrendale Expressway. If direction of population growth is considered as an indicator of possible changes in food distribution, a new wholesale food market should be located near the city limits west of the Golden Triangle.

Adequate Land at Reasonable Cost

The cost of land for a wholesale food distribution center (including the cost of buying and removing buildings that may be on the site and placing the land in condition for construction) is very important. It affects the total cost of the

²³ The acreage for the proposed facilities does not include highways on the perimeter of the market; these are assumed to be provided by the local municipalities.

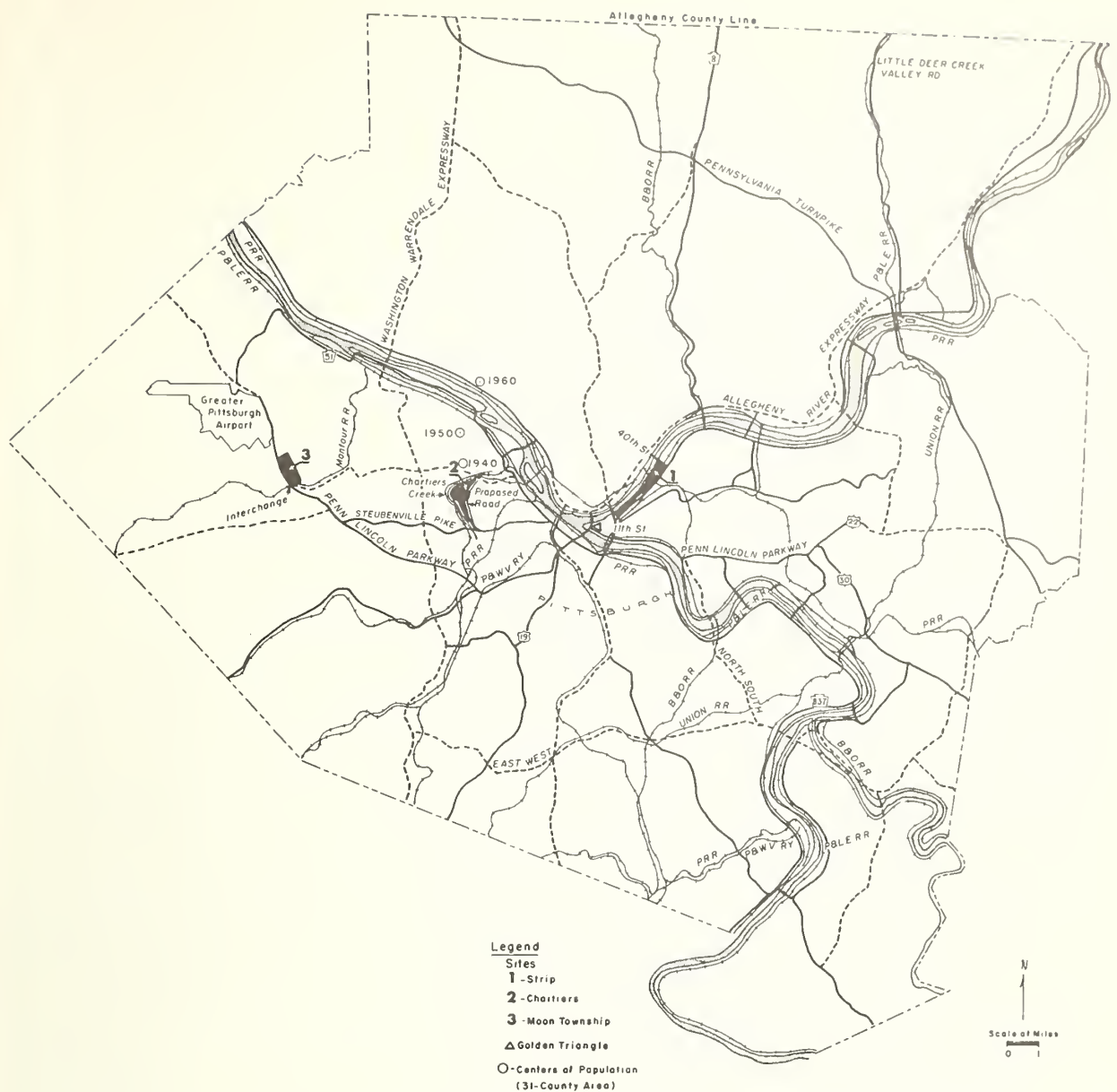


FIGURE 31.—Location of proposed sites with relation to the center of population.

project and the amount of rental income necessary to amortize the investment.

Failure to purchase sufficient land can result in higher operating costs for the center and an expensive expansion program later. If the distribution center is to be economically sound and financially self-liquidating, it is essential to obtain adequate acreage at a reasonable cost. Some sacrifice in convenience of location may be advisable if the price of land would cause rental charges to be unreasonably high.

Accessibility to Truck Transportation

Trucks handle about 63 percent of the inbound foods and nearly all distribution of foods. Pittsburgh has completed more than half of its limited access expressway system, which connects all parts of the metropolitan area with high-speed arteries. Any of the three sites to be evaluated would have access to these expressways when they are completed. Such access is a prerequisite to establishing a wholesale food center.

Accessibility to Rail Transportation

Railroads are accessible to each of the three sites selected for evaluation. However, problems appear to exist in arranging reciprocal switching between major rail carriers so as to place rail cars on house tracks or team tracks with a minimum delay and at reasonable costs. In some cities this has been accomplished with a unified switching service, often over a beltline railroad. The foundation for an improved switching system is evident because the Pittsburgh, Chartiers & Youghiogheny Railroad has working relations with the Pittsburgh & Lake Erie Railroad and the Pennsylvania Railroad; the P. & L.E. has working relations with the Baltimore & Ohio Railroad and the New York Central; and the Montour Railroad has working relations with the B. & O., PRR, and P. & L.E.

Wholesalers in several food groups definitely state that any new site must be served by all major railroads carrying foods or they will not be interested in moving to a new location. The authorities responsible for the market development should assure themselves that adequate rail access is completely workable before final arrangements for land purchase are made.

Accessibility to Public Utilities

Water, gas, electricity, and sewerage sufficient for commercial service should be close enough to the proposed site so that it would not be excessively expensive to meet such requirements. In a county where the urban area is expanding, some of the utilities not immediately available may be planned in areas where land is relatively undeveloped. This is often true where market sites are to be developed near the edge of a city.

Avoidance of Nonmarket Traffic

The handling of foods through wholesale facilities necessarily involves a large amount of trucking for bulky merchandise. The routing of normal and necessary traffic, even in a well-planned food distribution center, can be a serious problem. If vehicles not related to the food business also move through the market, unnecessary traffic congestion will result. Therefore, primary local streets should route traffic around the market to give a freer flow of all traffic.

Land Use, Topography, Shape of Tract, and Zoning

Current land use is very important in selecting a site. A vacant area, large enough to accommodate

a complete food distribution center, is hard to find near the center of distribution because most of the land has been developed for other purposes. One of two alternatives can be used to find a suitable site: Locate the new facilities near or outside the city limits, where vacant areas are available, or redevelop a suitable area within the city by demolishing present structures on the site. In either case, the decision of the market sponsors will be based to a large extent on the overall cost of acquisition and operation (including debt service charges, taxes, and the like). The selection of the site should be consistent with the master plan for maximizing land utilization as developed by the city and county.

The most desirable topography for a wholesale food center is level land at the same elevation as lead-in rail tracks and highways. The Pittsburgh area is generally hilly, and comparatively level land is often beside rivers which offer flood threats. Therefore, extensive earth grading should be expected. The possibility of adapting facilities to rolling terrain should be investigated for each possible site. Unusually steep grades are a major deterrent to economical railroad access.

The shape of the site selected should permit the highest degree of utilization for the arrangement of facilities. Irregularly shaped sites may not only require more acreage than sites properly shaped, but may also prevent an orderly layout of facilities. This will increase the market cost, require higher rentals and charges, and inconvenience users of the market.

Land selected should be properly zoned. It may be necessary to rezone some of the selected site, and some sections of the zoning code for food-processing facilities may have to be revised to update the code to modern food technology practices.

Sites Evaluated

During the study, several sites in the Pittsburgh area were suggested by various persons and organizations, including local government officials, transportation agencies, food wholesalers, and others interested in food marketing. Some sites were too small, others had serious drawbacks, but all were evaluated by the previously shown criteria.

Three sites in Allegheny County (Chartiers Valley, Moon Township, and the Strip) were selected for detailed evaluation. Figure 31 shows the location of these sites, the major existing and proposed highways, and railroads. None of these sites satisfied all of the requirements, but they are considered the most likely possibilities.

The following paragraphs define and evaluate these sites. The estimated cost of land for each site is shown in the next chapter.

Chartiers Valley Site.—Approximately 345 acres could be made available along the Chartiers Creek at Scully Yards. This site extends generally north to Wind Gap Bridge, east to Broadhead Manor, south to Ingram Bridge, and west to Chartiers Creek or Scully Yards tracks (south yards section).

A new highway is planned along the northeast edge of the site to connect with the Golden Triangle by way of existing roads along the Ohio River. Location of the planned highway on the edge of the site avoids congestion in the market by nonmarket traffic. This new highway is essential to establishing a wholesale food center on this site. Other planned highway connections in the area are vital to the continued growth of facilities at this location.

Scully Yards of the Pennsylvania Railroad occupies a large portion of this site. The Pittsburgh, Chartiers & Youghiogeny Railroad has a line through Scully Yards. This yard and lead-in tracks would require some relocation if facilities are developed here. Such relocation would enable better utilization of the land in the area. Grade approaches for house tracks would require special attention.

A hill of 900-foot elevation is the dominant feature of the northern part of this site. Chartiers Creek provides a substantial portion of this site's boundary. A low flood plain occupies the southern part of the site. Apparent formation of the hill would allow moving about 8 million cubic yards of earth to level the site to approximately 750 feet, and bring the low area above expected flood level. A curve in the creek should be straightened, as shown in figure 28. These actions are necessary for the best land utilization; they will make available approximately 90 acres of land that would otherwise be inaccessible by rail. Any necessary flood control dikes should be accomplished with U.S. Army Corps of Engineers consultation.

If most of the hill were not disturbed and the initial multiple-occupancy buildings were laid out in the present low area, adequately protected by flood control dikes, land development costs would be lower. However, total costs would be only about 11 percent lower than costs to utilize the entire site.

Another alternative would be to reduce the hill to 800 feet, which would require moving approximately 2.6 million cubic yards of earth. This reduction in earthmoving would result in only a 6-percent reduction in total estimated land and facilities costs. Leveling could not be accomplished at this elevation unless fill were brought onto the site. Terraces with connecting ramps

would be an alternative to leveling. Such ramps would definitely increase intramarket transportation distances and consequent operating costs. Therefore, terracing is not recommended, and such cost estimates have not been developed.

Most of the Chartiers Valley site is zoned for commercial development, although some residential lots are within the anticipated boundaries. A 54-inch-diameter sewer crosses the site, approximately north and south, below the level that will affect building. Other utilities serve the area adjacent to the site so extension into the market should not be a problem.

Moon Township Site.—Immediately northeast of the Montour Interchange on the Penn-Lincoln Parkway in Moon Township, an area of approximately 345 acres could be made available. This area is located immediately southeast of the Nelson Industrial Site. Using the parkway, this site is within 12 miles of the Golden Triangle.

The Montour Railroad has a rail line on the property adjacent to this site. With proper approach grading, it should be possible to enter the higher ground level of the site at reasonable cost. The area in which graded approaches must be made is less heavily populated than some of the rejected sites.

This site is undeveloped commercially; it is composed of farms and woodland. The terrain is hilly with two elevations above 1,100 feet. It would require an earthmoving operation of greater proportion than the Chartiers site to level this site for building; the leveling could be compared to that of the nearby Greater Pittsburgh Airport.

The present zoning in the affected part of Moon Township is a combination of industrial, commercial, and single-unit residential. All utilities except electricity must be brought to the site. However, the township is planning to develop such utilities as they are required.

Strip Site.—An enlargement of the present Strip area along the Allegheny River within a mile of downtown Pittsburgh and the Golden Triangle would involve a long narrow strip of land from 11th Street on the south to 40th Street on the north and extending east to the river side of Liberty Avenue. Such an enlargement would be necessary to retain the single location concept for the food distribution center. Although it would contain approximately 405 acres, only about 345 acres would be required. This land is estimated to cost over \$250,000 per acre in condition to build. Such high cost is prohibitive if the market is to be financially self-supporting.

Highway bridges across the Allegheny River could tie in a wholesale food center on the southeast side of the river with the Allegheny River Ex-

pressway (north side of river) and its connections around the Golden Triangle confluence. On the downtown side of the river, a through-traffic artery is planned along Liberty Avenue. Limited access points to and from the market center could be provided.

Team tracks and house tracks are maintained by the Baltimore & Ohio Railroad and the Pennsylvania Railroad in the present fruit and vegetable market area. Adequate rail access into the enlarged site is already available, but present yards and house tracks would require relocation.

The middle portion of the Strip site was described in the present facilities part of this report (p. 3). The southern extension from 16th Street to 11th Street is commercially zoned level land along the river. Flooding has been experienced, but it is not an annual problem. Most of the firms in the area are nonfood firms with transportation and distribution operations. The northern extension of the site is also level riverside land with similar flood experience. Zoning includes industrial, commercial, and residential lands. Most of this area has deteriorated to the point that redevelopment will be considered in large portions of the area from 23d Street to 52d Street. All public utilities are available in this area.

Sites eliminated.—Seven other sites were eliminated primarily because there was insufficient acreage for a complete distribution center or there was insufficient transportation access.

The Allegheny County Prison Farm contains 660 acres in Blawnox Township along the Allegheny River. The land rises too steeply for economical railroad access.

The Baldwin site contains 350 acres bounded by Route 837, Becks Run Road, Glass Run Road, and Second Avenue. The railroad grade or approaches to this site would be approximately 20 degrees, which is considered too steep for economical access.

The Mifflin Junction site contains 300 acres at Millers Grove near the intersection of the Wabash Union Railroad and the Baltimore & Ohio Railroad. This property is a vital slag dumping area, and deep ravines impair economical use as a wholesale food center.

The Nelson Industrial Site contains 450 acres in a valley east of the Montour interchange on the Airport Parkway. Most of the site has been committed to new industrial plants, and insufficient acreage remains for a complete food distribution center.

The Pitcairn Yards site contains 105 acres, bounded by Turtle Creek, State roads 993 and 180, and Wall Road. Even though the Pennsylvania Railroad uses only part of this railroad yard, there is insufficient land for a complete food distribution center.

The Sullivan-Harmarville site contains 170 acres along State route 910 near the intersection of the Pennsylvania Turnpike. This has insufficient acreage, and distribution costs from the site would be too great, because it is 19 miles from the center of distribution.

The Turtle Creek site contains 210 acres bounded by State routes 993 and 180, and the Wilmerding-Monroeville Road. Both rail and highway access are inadequate and acreage is not sufficient.

Estimated Investment in Land, Facilities, and Organization

The basic costs of constructing a wholesale food distribution center are land, facilities, and organizational costs. Most of the variations in investment between sites would be differences in acquiring land and conditioning it for building. Facilities and organizational costs will be about the same regardless of the site selected. The estimated costs in this chapter do not include government subsidies in any form. These costs are intended to be used as a guide in computing final estimates when the market site has been selected. The total investment costs are used as the basis for debt service later in the report.

Land

The estimated cost of land in condition to build at the Chartiers and Moon Township sites is slightly less than \$24,000 per acre. Comparable

land for redevelopment in the Strip is estimated to cost about \$250,000 per acre. These costs include the estimated market value of the land, demolition and grading costs, administrative charges, legal fees, and survey costs (table 11).

The land values of the Chartiers and Moon Township site were estimated by the city and county planning departments. Grading costs were estimated by preliminary engineering estimates and comparisons with similar projects; soil borings and detailed engineering studies were not made on these sites. Such borings would be among the initial responsibilities of potential developers or land assembly agencies. In the Strip area, land values of cleared land ready for redevelopment were estimated by the City Planning Department based on its experience in preparing land for the Golden Triangle and Civic Arena.

TABLE 11.—*Estimated cost per acre of purchasing land for the possible sites and placing it in condition to build*

Expense item	Chartiers	Moon Township	Strip area
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Land cost.....	¹ 3, 500	¹ 1, 800	-----
Land conditioning....	² 18, 000	³ 30, 000	(4)
Contingency (10 percent).....	2, 100	2, 100	-----
Total cost per acre (ready to build)....	23, 600	23, 900	250, 000

¹ These costs include the market value as estimated from recent area sales or obtained from county officials, plus 50 percent construction award and administrative fees.

² On the Chartiers site earthmoving was calculated at \$0.65 per cubic yard. Railroad property values were obtained from the Interstate Commerce Commission.

³ Earthmoving on the Moon Township site was based upon estimates given to the Federal Aviation Agency on runway conditioning at the nearby Greater Pittsburgh Airport.

⁴ The Department of City Planning (Pittsburgh) has experienced costs of preparing land for redevelopment ranging from 1.5 to 4.0 times the assessed value of the land. Based on the experience of properties near downtown Pittsburgh, it was estimated that the cost per acre for land in condition to build would be \$250,000, which is based on an assessed value of \$122,585 per acre.

Facilities

The costs of facilities are estimated on the basis of construction indices for Pittsburgh in late 1963, costs of similar facilities recently constructed, and preliminary estimates of local engineers. These cost estimates are for facilities previously described.

Multiple-occupancy buildings throughout the wholesale food center would be similar, although adaptations were designed to meet the requirements of each food group. Each unit of a multiple-occupancy building includes a mezzanine (or a complete second floor) with stairways, welfare rooms, basic plumbing, lighting fixtures, electrical outlets on the platform and inside area, and a heating system.

The costs shown do not include finishing the mezzanine office area, but do include the cost of additional basic plumbing and heating for mezzanine and second-floor areas. Outer walls of the second floor are included in the building shell. Equipment for refrigeration, packing, or handling is not included in estimates unless otherwise noted.

The estimated costs of individual-occupancy buildings are for basic fixtures comparable to

those in the multiple-occupancy buildings. The second-floor office area in each building would be different. An estimate of second-floor space was obtained by determining that the average second-floor space in existing new warehouses in Pittsburgh was 8 percent of the first-floor area. The total square foot cost for individual-occupancy buildings in the following food group costs includes an average second-floor area based on the 8 percent.

Estimates for paved surfaces for each food group include the prorated share of streets within the food distribution center. A similar system is used to prorate the share for lead-in tracks and rail switches from property boundaries to the buildings with house tracks. Other items included in the estimates are floodlights, house tracks, and sewers within the property boundaries. The cost to local municipalities for major highways and a main sewer line to the vicinity of the market is not included in these costs.

Organizational Fund

Funds must be available to organize and promote the required land and facilities, regardless of the types of financing and ownership that are used to develop the food distribution center. A fund to defray the estimated costs of development should become part of the total investment.

An estimate of the required annual organizational costs is \$60,000. This estimate includes expenses for a general manager, an assistant manager, a secretary, board members, office maintenance, insurance, and utilities. Such expenses are estimated to be required for 5 to 10 years. Some of the promotional fund may be allocated to existing development groups before the market organization group is formed. A fund of \$400,000 is suggested. This fund could be supplemented by a portion of the facilities rental income and land sales; however, this is not done in this report.

This organizational and promotional fund is prorated to each food group on the basis of required investment in land and facilities. The prorated amount of the fund is shown in the tabulation of investment costs in the next section.

Investment Costs

The following tabulations show the estimated costs of facilities, the architect's fee, the construction loan, a contingency allowance, and estimated organizational cost for each food group. The estimated costs are based on the arrangement on the Chartiers Valley site shown previously in figure 28. **The following estimates are NOT intended to replace firm estimates by local architects and contractors at the time of construction.**

Fresh Fruits and Vegetables

Buildings:

88 units in 4 multiple-occupancy buildings— 2,875 sq. ft. per unit (including mezzanines)—@ \$21,845 per unit (\$8.48 per sq. ft. for 2,500 sq. ft. at platform level plus \$1.72 per sq. ft. for 375 sq. ft. of mezzanine) (1 unit is for a restaurant, which requires an additional \$2,500 for plumbing and public restrooms.)	\$1,924,860
30 offices and an auction room over the units shown above, 15,000 sq. ft. @ \$8.50 per sq. ft.	127,500
4 individual-occupancy buildings totaling 93,680 sq. ft. of 1st-floor area @ \$9 per sq. ft.	843,120
Farmers' shed with 2 public restrooms @ \$3,600 each, 12,600 sq. ft. @ \$1.25 per sq. ft.	22,950

Other Facilities:

50 floodlights @ \$150 each	7,500
Paving—blacktop combination—154,910 sq. yds. @ \$4 per sq. yd.	619,640

Sewers:

5,800 ft. of 12" sanitary @ \$2.25 per linear ft.	13,050
13,700 ft. of 15" storm @ \$3.50 per linear ft.	47,950
Switches (railroad): 1 8 @ \$3,600 each	28,800
Tracks (house tracks and allocated lead-in) tracks: 8,820 ft. @ \$10 per linear ft. ¹	88,200

Cost of buildings and facilities..... 3,723,570

Other Costs:

Architect's fee—6% of building and facilities costs	223,414
Cost of construction including architect's fee	3,946,984
Construction loan—estimated at 5% of construction costs	197,349
Contingency—estimated at 10% of construction costs	394,698

Total cost of buildings, other facilities, and associated costs	4,539,031
Cost of 42.67 acres of land @ \$23,600	1,007,012
Organizational cost	56,400
Total investment	5,602,443

Meats and Meat Products

Buildings:

32 units in 2 multiple-occupancy buildings— 4,250 sq. ft. per unit (including 2d floor, but not including meat rails or refrigeration)—@ \$24,210 (\$8.48 per sq. ft. for 2,500 sq. ft. at platform level plus \$1.72 per sq. ft. for 1,750 sq. ft. of 2d-floor space)	\$774,720
5 individual-occupancy buildings totaling 573,750 sq. ft. of 1st-floor area @ \$9.25 per sq. ft.	5,307,188

Other Facilities:

10 floodlights @ \$150	1,500
Paving—blacktop combination—148,630 sq. yds. @ \$4 per sq. yd.	594,520

Sewers:

6,600 ft. of 12" sanitary @ \$2.25 per linear ft.	14,850
7,000 ft. of 15" storm @ \$3.50 per linear ft.	24,500

Other Facilities—Continued

Switches (railroad): 8 @ \$3,600 each	\$28,800
Tracks (house tracks and allocated lead-in tracks): 3,850 ft. @ \$10 per linear ft.	38,500

Cost of buildings and facilities..... 6,784,578

Other Costs:

Architect's fee—6% of building and facilities costs	407,075
Cost of construction including architect's fee	7,191,653
Construction loan—estimated at 5% of construction costs	359,853
Contingency—estimated at 10% of construction costs	719,165
Total cost of buildings, other facilities, and associated costs	8,270,671
Cost of 52.49 acres of land @ \$23,600 per acre	1,238,764
Organizational cost	96,800
Total investment	9,606,235

Processed Poultry

Buildings:

5 units in 1 multiple-occupancy building— 5,100 sq. ft. per unit—@ \$29,052 per unit (\$8.48 per sq. ft. for 3,000 sq. ft. at platform level plus \$1.72 per sq. ft. for 2,100 sq. ft. of 2d-floor space)	\$145,260
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Other Facilities:

4 floodlights, @ \$150 each	600
Paving—blacktop combination—4,020 sq. yds. @ \$4 per sq. yd.	16,080

Sewers:

175 ft. of 12" sanitary @ \$2.25 per linear ft.	394
350 ft. of 15" storm @ \$3.50 per linear ft.	1,225

Cost of buildings and other facilities 163,559

Other Costs:

Architect's fee—6% of building and facilities cost	9,814
Cost of construction including architect's fee	173,373
Construction loan—estimated at 5% of construction costs	8,669
Contingency—estimated at 10% of construction costs	17,337

Total cost of buildings, other facilities, and associated costs	199,379
Cost of 1.68 acres of land @ \$23,600 per acre	39,648
Organizational cost	2,400

Total investment 241,427

Groceries

Buildings:

40 units in 2 multiple-occupancy buildings— 2,875 sq. ft. per unit (including mezzanines)—@ \$20,045 per unit (\$7.76 per sq. ft. for 2,500 sq. ft. at platform level plus \$1.72 per sq. ft. for 375 sq. ft. of mezzanine)	\$801,800
6 individual-occupancy buildings (including food-chain warehouses) totaling 1,060,000 sq. ft. of 1st-floor area @ \$8.70 per sq. ft.	9,222,000

Other Facilities:

52 floodlights @ \$150 each	7,800
Paving—blacktop combination—233,950 sq. yds. @ \$4 per sq. yd.	935,800

¹ Railroad equipment is based on cost indices from the Interstate Commerce Commission and the Association of American Railroads.

Other Facilities—Continued

Sewers:	
2,350 ft. of 12" sanitary @ \$2.25 per linear ft.	\$5,287
11,410 ft. of 15" storm @ 3.50 per linear ft.	39,935
Switches (railroad): 8 @ 3,600 each	28,800
Tracks (house tracks and allocated lead-in tracks): 13,570 ft. @ \$10 per linear ft.	135,700
Cost of buildings and facilities	11,177,122
Other Costs:	
Architect's fee—6% of building and facilities costs	670,627
Cost of construction including architect's fee	11,847,749
Construction loan—estimated at 5% of construction costs	592,387
Contingency—estimated at 10% of construction costs	1,184,775
Total cost of buildings, other facilities, and associated costs	13,624,911
Cost of 94.94 acres of land @ \$23,600 per acre	2,240,584
Organizational cost	166,400
Total investment	16,031,895

Manufactured Dairy Products and Eggs

Buildings:

23 units in 2 multiple-occupancy buildings—2,875 sq. ft. per unit (including mezzanines)—@ \$21,845 per unit (\$8.48 per sq. ft. per 2,500 sq. ft. at platform level plus \$1.72 per sq. ft. for 375 sq. ft. of mezzanine). (Use of units is planned as 20 units for eggs, 2 for dairy products, and 1 for a restaurant which requires an additional \$2,500 for plumbing and public restrooms)	\$504,935
1 individual-occupancy building with 48,000 sq. ft. of 1st-floor area @ \$9 per sq. ft.	432,000

Other facilities:

14 Floodlights @ \$150 each	2,100
Paving—blacktop combination—28,980 sq. yds. @ \$4 per sq. yd.	115,920
Sewers:	
650 ft. of 12" sanitary @ \$2.25 per linear ft.	1,463
1,380 ft. of 15" storm @ \$3.50 per linear ft.	4,830
Switches (railroad): 2 @ \$3,600	7,200
Tracks (house tracks and allocated lead-in tracks): 1,070 ft. @ \$10 per linear ft.	10,700
Cost of buildings and other facilities	1,079,148

Other costs:

Architects fee—6% of building and facilities cost	64,749
Cost of construction including architect's fee	1,143,897
Construction loan—estimated at 5% of construction costs	57,195
Contingency—estimated at 10% of construction costs	114,390
Total cost of buildings, other facilities, and associated costs	1,315,482
Cost of 9.42 acres of land @ \$23,600 per acre	222,312
Organizational cost	15,600
Total investment	1,553,394

Frozen Foods

Buildings:

8 units in 1 special-purpose multiple-occupancy building of 75,000 sq. ft. of 1st-floor area @ \$9 per sq. ft.; freezer area in this building occupies 51,600 sq. ft. (or 928,800 cu. ft.) at an additional \$10 per sq. ft.	\$1,191,000
3 individual-occupancy buildings totaling 58,000 sq. ft. of 1st-floor area @ \$9 per sq. ft. (refrigeration and insulation to be installed by user) 2,000 sq. ft. of 2d-floor office space @ \$9 per sq. ft.	540,000
Other Facilities:	
16 floodlights @ \$150 each	2,400
Paving—blacktop combination—18,510 sq. yds. @ \$4 per sq. yd.	14,040
Sewers:	
600 ft. of 12" sanitary @ \$2.25 per linear ft.	1,350
1,600 ft. of 15" storm @ \$3.50 per linear ft.	5,600
Switches (railroad): 4 @ \$3,600 each	74,400
Tracks (house tracks and allocated lead-in tracks): 1,100 ft. @ \$10 per linear ft.	11,000
Cost of buildings and facilities	1,839,790

Other costs:

Architect's fee—6% of buildings and facilities costs	110,387
Cost of construction including architect's fee	1,950,177
Construction loan—estimated at 5% of construction costs	97,509
Contingency—estimated at 10% of construction costs	195,018
Total cost of buildings, other facilities, and associated costs	2,242,704
Cost of 15.37 acres of land @ \$23,600 per acre	362,732
Organizational cost	26,800
Total investment	2,632,236

Fishery Products

Buildings:

10 units in 1 multiple-occupancy building—4,025 sq. ft. per unit (including mezzanines)—@ \$30,580 per unit (\$8.48 per sq. ft. for 3,500 sq. ft. at platform level plus \$1.72 per sq. ft. for 525 sq. ft. of mezzanine)	\$305,800
Other Facilities:	
4 floodlights, @ \$150 each	600
Paving—blacktop combination—12,200 sq. yds. @ \$4 per sq. yd.	48,800
Sewers:	
750 ft. of 12" sanitary @ \$2.25 per linear ft.	1,688
1,425 ft. of 15" storm @ \$3.50 per linear ft.	4,987
Switches (railroad): 1 @ \$3,600	3,600
Tracks (house tracks and allocated lead-in tracks): 400 ft. @ \$10 per linear ft.	4,000
Cost of buildings and facilities	369,475

Other Costs:

Architect's fee—6% of building and facilities costs	22,169
Cost of construction including architect's fee	391,644
Construction loan—estimated at 5% of construction costs	19,582

Other Costs—Continued	
Contingency—estimated at 10% of construction costs-----	\$39, 164
Total cost of buildings, other facilities, and associated costs-----	450, 390
Cost of 3.43 acres of land @ \$23,600 per acre-----	80, 948
Organizational cost-----	5, 600
Total investment-----	536, 938

Allied Industries

Land only:	
Cost of 125 acres of land @ \$23,600 per acre-----	\$2, 950, 000
Organizational cost-----	30, 000
Total investment-----	2, 980, 000

Summary of Investment Costs

Facilities and organizational costs are assumed to be the same on any site, \$30,600 for facilities

and \$400,000 for organization. Table 12 shows the addition of land, which differs as described previously, to facilities and organizational costs.

TABLE 12.—*Summary of investment in land, facilities, and organizational costs on 3 sites*

Expense item	Chartiers Valley	Moon Township	Strip area
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Land-----	8, 142, 000	8, 245, 500	86, 250, 000
Facilities ¹ -----	30, 642, 600	30, 642, 600	30, 642, 600
Organizational costs-----	400, 000	400, 000	400, 000
Total---	39, 184, 600	39, 288, 100	117, 292, 600

¹ Rounded to the nearest hundred.

Financing and Ownership of the Proposed Center

There are several ways to finance and operate wholesale food distribution centers. Such projects have been handled through (1) private corporations, (2) public benefit corporations (non-profit), (3) direct public ownership, (4) cooperatives, and (5) various combinations of these methods. Descriptions of these methods follow, as each might apply to Pittsburgh.²⁴ Regardless of the organizational structure used, an entity should be formed to finance and develop a wholesale food distribution center including the allied industries area. This organization should be set up by competent legal counsel; the following description merely outlines known existing enabling legislation in Pennsylvania.

Private Corporation

A private corporation is a State-chartered legal entity that is organized either for profit, as is the usual case, or is declared to be a nonprofit concern. The size and nature of a corporation organized to develop the market could differ, depending upon the source of finances and the control the lenders desired to impose on the use of money.

The primary advantage of private corporate ownership is the greater degree of control that the owners have in the development—subject only to generalized legal restrictions of State statutes. When the indebtedness has been repaid, the entire investment belongs to the stockholders. These stockholders could be the tenants or any other in-

vestors (unless limited by corporate charter) desirous of investing equity capital in the project. A major problem in private corporate ownership of the wholesale food center is that substantial equity capital is necessary. Another possible problem is that the private owners may not choose to handle the development in the public interest.

A number of wholesale markets are owned and operated by private corporations. In corporations that have many voting shares spread over a rather large group, the principal stockholders are usually the food wholesalers. In other cases, closely held firms have developed markets. For example, railroads built large terminal produce markets in the 1920's, and independent construction and development firms have built facilities and leased them to food handlers.

Public Benefit Corporations

State and local governments can create a public benefit corporation (nonprofit corporation) to perform specific functions such as ownership and management of port facilities, local mass transportation, or food distribution facilities. Often such a creation is known as an "authority." In Pennsylvania, State enabling legislation specifically designed to ease the establishment of "market authorities" has not been enacted; however, the Philadelphia Food Distribution Center was created as a nonprofit corporation.

In the laws of some States, nonprofit corporations are by definition known as public benefit corporations. There are several advantages in such a corporation: (1) As a nonprofit agency,

²⁴ Detailed finance and ownership methods that have been used in different parts of the country are discussed in a separate report (7).

rentals and other charges do not exceed the funds required to sustain the annual operating costs, amortization of the investment, and maintenance of the reserve. (2) It may be empowered to issue revenue bonds, which are often tax exempt. Such bonds may or may not be backed by the revenue power of the political subdivision, but bonds that are backed are readily salable at lower interest rates. (3) A public authority for wholesale food facilities, management oriented to public service, would be more apt to provide for future expansion and the establishment of a complete facility than would some private corporations.

There are some limitations to a public benefit corporation: (1) Often it cannot raise funds except through the sale of revenue bonds or through additional appropriations. For this type of ownership, equity funds are needed just as for a private corporation, unless the indebtedness of the public benefit corporation is guaranteed by some level of government. Usually the original equity funds are land grants or appropriated funds. (2) The continuity of management of some markets has been dependent on the political administration in office. (3) Such public entities do not have the operational freedom of private ownership.

When a market is owned and operated by a non-profit private corporation, the shares of voting stock usually are limited to firms or individuals directly connected with the use of market facilities. Such wholesalers, truckers, and farmers may participate in proportion to the space used by the firm. A nonprofit corporation may require nonvoting shares in addition to voting shares.

Direct Public Ownership

Wholesale food market facilities have been financed, constructed, and operated by State or local governments. Several States have enabling legislation to assist in improving or establishing markets.

Direct State ownership and operation of a wholesale market facility usually can be differentiated from ownership and operation by a State market authority by the methods of financing and by the delegation of authority by the State legislature. Although a number of States have appropriated funds and otherwise assisted market authorities with financial problems, they do not usually underwrite the total cost of a market constructed by an authority. Nor have the States usually assumed responsibility for the operation of these markets after they were constructed. With direct State ownership a market facility is financed in whole or in greater part by an appro-

priation of State funds. Also, the State is responsible for maintenance and other expenses involved in the operation of a State-owned market.

Municipal or county ownership of a wholesale food market is comparable in many respects to direct State ownership. A number of municipalities are authorized in their charters to construct and operate food markets. However, some city councils or commissions are not authorized to make appropriations from general funds on the city treasury for the construction of market facilities on a basis comparable to that of a State legislative body. Three methods are usually open to municipalities for financing a market program: (1) Issuance of municipal bonds, (2) issuance of revenue warrants, and (3) loans from public corporations. In many cities the issuance of bonds for such purposes must be approved by a majority of the qualified electorate voting in a referendum. States may finance, construct, and operate wholesale produce market facilities instead of cities, because legislative bodies feel that improved facilities will serve the public interest of an area beyond the city limits.

Facilities constructed with local government funds would be owned by that government agency. Rent would be paid by the tenants indefinitely, unless other provisions for transfer of ownership were made following the repayment of indebtedness.

Cooperative Associations

Pennsylvania, like many other States with substantial agricultural resources, was among the first States to establish farmers' cooperatives in 1868. However, a farmers' cooperative could not be used as the primary organizational instrument for the proposed wholesale food distribution center, because the proposed market would not meet the requirement of the Capper-Volstead Act that nonfarmer members' volume cannot exceed the volume of farmer members. It would be possible for the farmers' market section to use a farmers' cooperative as the organizational tool to lease and operate their portion of the market with a minimum of control by the market developer. The Allegheny County Fruit & Vegetable Growers Association is a corporate body that could operate the farmers' market with its present organizational structure. As a farmers' cooperative, it operates for the mutual benefit of its members. Usually, a cooperative is incorporated, owned, and controlled by member agricultural producers for the purpose of marketing their own farm products. The organization would operate on a cost basis.

Agricultural cooperatives, which comply with rather rigid requirements, can be accorded special

treatment under State and Federal income tax laws. However, these agricultural cooperatives pay property taxes and other taxes paid by businesses, as required by law.

Pennsylvania Public Law 365 (1887) provides for cooperative associations that would not be classified as farmers' cooperatives. Such an association could be the land area developer or the operator of the multiple-occupancy buildings (17). If this type of cooperative association were used, it would be organized on the one-vote-per-member basis for the mutual benefit of its members and in the public interest.

Combinations of Methods

Wholesale food markets have been established combining two or more of the types of ownership and operation previously discussed. For example, a food distribution center has been developed in Philadelphia by a nonprofit organization (an authority) on land owned and put in condition for building by the city. This corporation owns some of the buildings, while others are privately owned by firms which purchased their sites.

In Pittsburgh, it would be possible to use two or more methods to finance a food center. Officials responsible for regional and local development are designing financing plans that group the advantages of several financing alternatives. The Federal Government has initiated or continued area redevelopment and urban redevelopment projects in western Pennsylvania. Low-cost loans or loan guarantees for private capital under these programs enable such projects as the development of improved wholesale food marketing facilities to obtain funds at approximately 4 percent. Such loans normally are available to local public groups created to administer development functions. Thus, an authority for market development coordinates financing arrangements with the city, county, State, Federal, and private groups to enable lower rentals than could be provided by all private financing.

The proposed wholesale food distribution center is planned to be a self-supporting entity. Costs can be held down by using government-guaranteed funds judiciously and by taking other steps to minimize revenues required.

Three assumptions are closely related to financing the proposed distribution center: (1) An authority with the power of eminent domain and financial bargaining power would develop either of the two lowest cost sites at approximately the same cost. (2) Federal and State funds are available to local municipalities for access highways,

sewers, engineering studies, and land preparation by a redevelopment authority.²⁵ (3) No Federal writedown of land development costs is assumed in any consideration. The latter assumption was based on the decision by local planners to complete a market as a non-federally-assisted urban renewal project. Such a decision to use local funds was considered necessary with reference to applications for assistance on other redevelopment projects.

The entire wholesale market could be constructed and operated by a single agency, or various parts could be constructed and operated by different agencies. To illustrate, a local government might acquire and prepare the site for building; the farmers' market section could be constructed and operated by a corporation, a cooperative, or under city or State ownership; multiple-occupancy buildings could be constructed and operated by some other combination; and the individual buildings could be financed by their occupants.

Figure 32 shows a possible organizational structure for the proposed facilities in Pittsburgh. A corporation, possibly known as the Food Marketing Center, could promote the complete land area in stages with land obtained and held for market development by the city or county redevelopment authority. Subdivisions such as the farmers' market section and the multiple-occupancy buildings would have operational control and possibly ownership of their respective areas, depending on the methods of financing used.

Initially, an organization such as the Regional Industrial Development Corporation, a public benefit corporation, could sponsor the proposed food facilities.²⁶ The agency commissioned to develop and promote the food distribution center should be designated before lease negotiations or land sales. The developer-promoter would obtain land in stages from the city or county redevelopment authority, which had assembled the complete land parcel for the food facilities. The cost of holding this land would be 2 percent per year of the value of land in condition to build; this additional development cost should be borne by latecomers as long as the land price remains competitive. Land

²⁵ Funds for local municipalities include grants (up to 50 percent of project costs) and loans available from the Community Facilities Service of the Housing and Home Finance Agency (Washington, D.C.) and similar agencies in Pennsylvania (Harrisburg, Pa.).

²⁶ Mayor Joseph M. Barr of Pittsburgh referred to RIDC as an implementing instrument in his introductory remarks to the public presentation of the findings of this study on June 7, 1962.

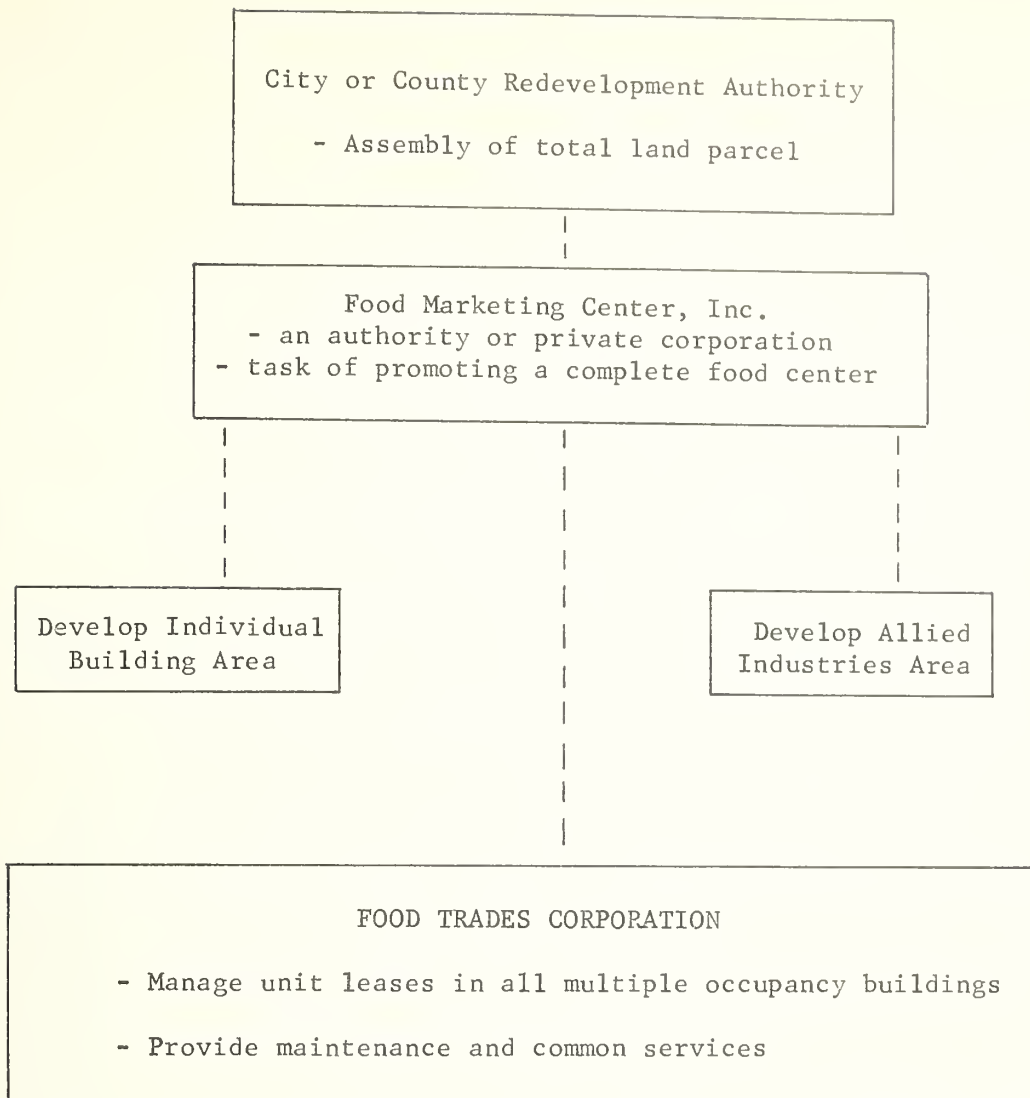


FIGURE 32.—Possible organizational structure to develop the wholesale food distribution center.

held for the distribution center by the redevelopment authority should be designated for food

marketing purposes and allied industries for at least 10 years.

Estimated Annual Revenue Required

The method selected to finance and operate the proposed market will affect the annual revenue required. These requirements are composed of (1) debt service, (2) real estate taxes, and (3) management and maintenance. Unsubsidized costs have been considered thus far in this report, and the first revenue requirements are based on private financing. Alternative calculations of annual revenue requirements are based in the assumption that a local authority will be organized to develop the market as a self-sustaining entity.

Multiple-occupancy buildings are planned to be financed and operated by a firm designed as a property management group (shown as the Food Trades Corporation in fig. 32). However, it is assumed for purposes of this report that land for individual buildings will be sold to a firm which will arrange for construction, operation, and maintenance. Such construction should be approved by the agency commissioned to develop the market. In actuality, some buildings could be constructed by the agency for long-term leases.

Debt Service

The wholesale food distribution center should be financed so that it will be a self-sustaining entity within an amortization period of approximately 25 years. The facilities proposed in this report will not become obsolete for 30 years or more, assuming no drastic and unforeseen change in food marketing trends. More likely, the market will be used for a much longer time. The type of buildings in the food center are adaptable with minor alterations for many other uses, such as light manufacturing and general warehousing. Thus, the facilities can be a desirable realty investment.

Three sources of financing are (1) first-mortgage bonds, (2) a second mortgage or preferred stock, and (3) equity capital. Depending on the money market at the time of the financial arrangements, various amounts might be obtained from these sources. However, different use rates are charged by these sources. Assuming the borrower to be a private firm, estimated rates with anticipated money market conditions would approximate 5½ percent on the first mortgage, 6½ percent on the second mortgage, and 7 percent might be the alternative use value of equity capital. A development corporation or authority backed by local government could conceivably obtain a portion of the required funds for approximately 4 percent.²⁷ If equity capital of about 10 percent were supplied by tenants, there would probably be no dividend payment to stockholders during the initial years. Approximated financial sources include 65 percent from a first mortgage and 25 percent from a second mortgage.

If bonds were issued, financiers would probably insist that current income exceed current expenses by a stipulated reserve percentage. This reserve should approximate a sum equal to the annual amortization cost; thus the amount of this reserve requirement should be added to the funds required initially.

Before the precise financial plan and administrative structure is designed, the terms of loan requirements cannot be foretold. At this point, it is assumed that financing will be by a private developer whose interest cost from all financial sources is 6 percent for 25 years. Table 13 shows the estimated debt service cost to amortize the food marketing center by food group and type of building.

TABLE 13.—*Estimated annual debt service, by food groups and sites, for the proposed wholesale food facilities*

Food group	Chartiers	Moon Township	Strip
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Fresh fruits and vegetables:			
Total investment ¹ ----	5, 602, 443	5, 615, 244	15, 262, 931
Amortization ² -----	438, 279	439, 281	1, 194, 019
Debt reserve ³ -----	43, 828	43, 928	119, 402
Total debt service-----	482, 107	483, 209	1, 313, 421
Meat and meat products:			
Total investment ¹ ----	9, 606, 235	9, 621, 982	21, 489, 971
Amortization ² -----	751, 496	752, 728	1, 681, 160
Debt reserve ³ -----	75, 150	75, 273	168, 116
Total debt service-----	826, 646	828, 001	1, 849, 276
Processed poultry:			
Total investment ¹ ----	241, 427	241, 931	621, 779
Amortization ² -----	18, 889	18, 926	48, 642
Debt reserve ³ -----	1, 889	1, 893	4, 864
Total debt service-----	20, 778	20, 819	53, 506
Groceries:			
Total investment ¹ ----	16, 031, 895	16, 060, 377	37, 526, 311
Amortization ² -----	1, 254, 175	1, 256, 403	2, 935, 683
Debt reserve ³ -----	125, 418	125, 640	293, 568
Total debt service-----	1, 379, 593	1, 382, 043	3, 229, 251
Manufactured dairy products and eggs:			
Total investment ¹ ----	1, 553, 394	1, 556, 220	3, 686, 082
Amortization ² -----	121, 522	121, 743	288, 362
Debt reserve ³ -----	12, 152	12, 174	28, 836
Total debt service-----	133, 674	133, 917	317, 198
Frozen foods:			
Total investment ¹ ----	2, 632, 236	2, 636, 847	6, 112, 004
Amortization ² -----	205, 920	206, 281	478, 114
Debt reserve ³ -----	20, 592	20, 628	47, 811
Total debt service-----	226, 512	226, 909	525, 925
Fishery products:			
Total investment ¹ ----	536, 938	537, 967	3, 479, 504
Amortization ² -----	42, 005	42, 085	272, 202
Debt reserve ³ -----	4, 201	4, 209	27, 220
Total debt service-----	46, 206	46, 294	299, 422

Footnotes at end of table.

²⁷ This is based on bond interest and credit rating as given by Community Facilities Service, Housing and Home Finance Administration, for city of Pittsburgh and authorities in that locality.

TABLE 13.—*Estimated annual debt service, by food groups and sites, for the proposed wholesale food facilities*—Continued

Food group	Chartiers	Moon Township	Strip
Allied industries:			
Total investment ¹ (no buildings)-----	<i>Dollars</i> 2, 980, 000	<i>Dollars</i> 3, 017, 500	<i>Dollars</i> 31, 280, 000
Amortization ² -----	233, 125	236, 059	2, 447, 034
Debt reserve ³ -----	23, 313	23, 606	244, 703
Total debt service-----	256, 438	259, 665	2, 691, 737
Total of above groups:			
Total investment ¹ -----	39, 184, 568	39, 288, 068	119, 458, 582
Amortization ² -----	3, 065, 411	3, 073, 506	9, 345, 216
Debt reserve ³ -----	306, 543	307, 351	934, 520
Total debt service-----	3, 371, 954	3, 380, 857	10, 279, 736

¹ Based on investment in land, facilities, and organizational costs.

² Assuming an average interest rate of 6 percent and amortization for 25 years, or \$78.23 per \$1,000 per year.

³ Computed at 10 percent of the annual amortization charge.

Real Estate Taxes

The firm managing all of the multiple-occupancy buildings and each firm that purchases land for building would pay taxes on land and buildings on the basis of the current tax rate and assessed valuation. The city and county planning departments confirmed indications that the percentage of current value used in assessment for new general warehouse facilities would be somewhat greater than present commercial ratios. Data from the State Tax Equalization Board (Harrisburg) indicated that in the year of the study the commercial assessment ratio for Pittsburgh was 61.3 percent and for Moon Township 45.6 percent of market value.²⁸ At all possible sites, the market value is assumed to be the total investment previously shown. A contingency fund, varying from 4 to 8 percent depending on the going tax schedule in the respective municipality, is included to provide for probable tax increases. After a sizable reserve is accumulated, this might be discontinued (table 14).

There are other local taxes, such as the mercantile tax and license fees. However, these taxes should not affect the location of the facilities because it is expected that the overall tax burden in the metropolitan area will tend to equalize during the amortization period.

²⁸ Assessment ratio for Pittsburgh applies to both the Strip and Chartiers sites.

Management and Maintenance Costs

A corporation headed by a market manager will be organized to administer rentals and maintain the multiple-occupancy buildings (designated as the Food Trades Corporation in fig. 32). The food groups are not large enough to justify a trade corporation for each group to handle these rentals and other services; thus it is advantageous to combine all management and maintenance functions into one corporation. Assistant managers may be desired to administer one or more food groups. These activities would be centralized under the market manager; his duties are composed of promoting food wholesaling as it affects the average wholesaler, providing housekeeping services common to the entire rented area, and collecting rents. The estimated costs of these functions are in the following tabulation. Any annual operating overage will be held in a reserve fund for appropriate distribution or contingencies.

Estimated annual management and maintenance costs for the proposed multiple-occupancy buildings.

	Annual cost items	Dollars
Salaries:		
1 market manager-----		15,000
3 assistant managers @ \$8,000 each ¹ -----		24, 000
1 bookkeeper-----		5, 000
3 secretary-switchboard operators @ \$4,000 each -----		12, 000
9 watchmen and laborers @ \$4,000 each-----		36, 000
1 janitor-----		4, 000
Fringe benefits 12% (for above)-----		11, 520
Office rent-----		4, 000
Travel-----		5, 000
Advertising and promotion-----		12, 000
Office supplies and equipment-----		2, 500
Telephone and other communications-----		1, 500
Special services (legal, audit, etc.)-----		12, 000
Insurance: ²		
Fire and comprehensive-----		7, 430
Liability-----		1, 310
Utilities (common to entire rented area)-----		8, 000
Street cleaning and snow removal ³ -----		35, 000
Maintenance of multiple-occupancy area ⁴ -----		58, 000
Contingency (10% until reserve established)-----		25, 300
Total-----		279, 560

¹ Assistant managers could serve initially in these categories:

Fresh fruits and vegetables including farm sheds.
Meat and meat products, poultry and eggs, and fish.
Groceries, dairy products, and frozen foods.

² Fire and comprehensive insurance has been calculated on the basis of 80% of multiple-occupancy buildings' cost @ \$1.15/\$1,000; liability is based on \$750,000 @ \$1.75/\$1,000.

³ Streets belong to the food center; cleaning, etc., can be most effectively accomplished by the center. However, a local tax adjustment for services not required is suggested.

⁴ Maintenance is based on 0.75% of construction costs including paving, buildings, etc.; all overages held in reserve.

TABLE 14.—*Estimated annual real estate taxes, by food groups, for the proposed wholesale food facilities*

Food group	Investment in land and facilities ¹	Assessed value ²	Tax ³	Contingency	Estimated total tax ⁴
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Fresh fruits and vegetables:					
Chartiers Valley	5,546,043	3,399,724	166,108	6,644	172,752
Moon Township	5,558,844	2,534,833	106,928	5,314	112,242
Strip	15,206,531	9,321,604	545,108	21,804	566,912
Meat and meat products:					
Chartiers Valley	9,509,435	5,829,284	279,280	11,171	290,451
Moon Township	9,525,182	4,343,483	178,083	14,247	192,330
Strip	21,393,171	13,114,014	745,503	29,820	775,323
Processed poultry:					
Chartiers Valley	239,027	146,523	7,079	283	7,362
Moon Township	239,531	109,226	4,478	358	4,836
Strip	619,379	379,679	22,038	881	22,919
Groceries:					
Chartiers Valley	15,865,495	9,725,548	467,922	18,717	486,639
Moon Township	15,893,977	7,247,654	297,154	23,772	320,926
Strip	37,359,911	22,901,625	1,311,191	52,448	1,363,639
Manufactured dairy products and eggs:					
Chartiers Valley	1,537,794	942,668	45,412	1,817	47,229
Moon Township	1,540,620	702,523	28,803	2,304	31,107
Strip	3,670,482	2,250,005	129,082	5,163	134,245
Frozen foods:					
Chartiers Valley	2,605,436	1,597,132	70,779	2,831	73,610
Moon Township	2,610,047	1,190,181	48,797	3,904	52,701
Strip	6,085,204	3,730,230	213,301	8,532	221,833
Fishery products:					
Chartiers Valley	531,338	325,710	15,737	629	16,366
Moon Township	532,367	242,759	9,953	796	10,749
Strip	1,660,390	1,017,819	60,033	2,401	62,434
Totals:					
Chartiers Valley	35,834,568	21,966,589	1,052,317	42,092	1,094,409
Moon Township	35,900,568	16,370,659	671,196	53,695	724,891
Strip	85,995,068	52,714,976	3,026,256	121,049	3,147,305

¹ Based on investment in land and facilities shown on pp. 54 through 56.

² Based on commercial assessments of 61.3 percent in Pittsburgh and 45.6 percent in Moon Township.

³ In Pittsburgh, the tax rates for the period were 37

mills per dollar for land, 18.5 mills per dollar for buildings, and 27 mills per dollar for the county and schools. In Moon Township, the tax rate was combined at 41 mills per dollar of assessed valuation.

⁴ Tax plus contingency fund for probable tax increases.

Individual-building occupants are assumed to be leasing (or have purchased) their land and facilities directly from the developer-promoter. Since no management and maintenance functions would be performed by the developer, payments would not include such services. This policy is consistent with earlier sections of this report which do not show interior layouts for individual buildings.

Summary of Annual Revenue Required

Utilizing private financing, the annual revenue required would be approximately \$4.7 million on the Chartiers Valley site, \$4.4 million on the Moon

Township site, and \$13.7 million on the Strip site (table 15).

Assuming authority financing with an interest rate near 4 percent for the same amortization period (25 years), the annual revenue required would be approximately \$3.9 million on the Chartiers Valley site and \$3.5 million on the Moon Township site.²⁹ The annual revenue required on the Strip site with higher land costs would be approximately \$11.1 million (table 16).

²⁹ The interest rate of approximately 4 percent for 25 years applies to debt service. All other costs, real estate taxes, and costs of management and maintenance, are assumed to be the same as used in calculation of annual revenue required using private financing.

TABLE 15.—*Estimated annual revenue required for the proposed wholesale facilities, assuming private financing*¹

Food group	Chartiers	Moon Township	Strip
Fresh fruits and vegetables:	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Debt service.....	482, 107	483, 209	1, 313, 421
Real estate taxes....	172, 752	112, 242	566, 912
Management and maintenance.....	95, 050	95, 050	95, 050
Total.....	749, 909	690, 501	1, 975, 383
Meat and meat products:			
Debt service.....	826, 646	828, 001	1, 849, 276
Real estate taxes....	290, 451	192, 330	775, 323
Management and maintenance.....	36, 343	36, 343	36, 343
Total.....	1, 153, 440	1, 056, 674	2, 660, 942
Processed poultry:			
Debt service.....	20, 778	20, 819	53, 506
Real estate taxes....	7, 362	4, 836	22, 919
Management and maintenance.....	8, 387	8, 387	8, 387
Total.....	36, 527	34, 042	84, 812
Groceries:			
Debt service.....	1, 379, 593	1, 382, 043	3, 229, 251
Real estate taxes....	486, 639	320, 926	1, 363, 639
Management and maintenance.....	41, 934	41, 934	41, 934
Total.....	1, 908, 166	1, 754, 903	4, 634, 824
Manufactured dairy products and eggs:			
Debt service.....	133, 674	133, 917	317, 198
Real estate taxes....	47, 229	31, 107	134, 245
Management and maintenance.....	25, 160	25, 160	25, 160
Total.....	206, 063	190, 184	476, 603
Frozen foods:			
Debt service.....	226, 512	226, 909	525, 925
Real estate taxes....	73, 610	52, 701	221, 833
Management and maintenance.....	58, 708	58, 708	58, 708
Total.....	358, 830	338, 318	806, 466
Fishery products:			
Debt service.....	46, 206	46, 294	299, 422
Real estate taxes....	16, 366	10, 749	62, 434
Management and maintenance.....	13, 978	13, 978	13, 978
Total.....	76, 550	71, 021	375, 834

TABLE 15.—*Estimated annual revenue required for the proposed wholesale facilities, assuming private financing*¹—Continued

Food group	Chartiers	Moon Township	Strip
Allied industries (land only):	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Debt service.....	256, 438	259, 665	2, 691, 737
Real estate taxes....	(2)	(2)	(2)
Management and maintenance.....	(3)	(3)	(3)
Total.....	256, 438	259, 665	2, 691, 737
Total of above groups:			
Debt service.....	3, 371, 954	3, 380, 857	10, 279, 736
Real estate taxes....	1, 094, 409	724, 891	3, 147, 305
Management and maintenance.....	279, 560	279, 560	279, 560
Grand total....	4, 745, 923	4, 395, 308	13, 706, 601

¹ Based on private financing and no modification of real estate taxes.

² No real estate taxes are charged until this land is sold for development.

³ Management is the form of organizational and development charges included in total investment. (See pp. 54 through 56.)

TABLE 16.—*Estimated annual revenue required for proposed wholesale facilities, assuming authority financing*¹

Food group	Chartiers	Moon Township	Strip ²
Fresh fruits and vegetables.....	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Meat and meat products.....	629, 382	569, 699	1, 647, 028
Processed poultry.....	946, 778	849, 674	2, 198, 623
Groceries.....	31, 333	28, 837	71, 436
Manufactured dairy products and eggs.....	1, 563, 268	1, 409, 392	3, 827, 511
Frozen foods.....	172, 645	156, 705	397, 304
Fishery products.....	302, 202	281, 591	674, 985
Allied industries (land only).....	65, 000	59, 447	300, 979
Total.....	192, 328	194, 749	2, 018, 803
Total.....	3, 902, 936	3, 550, 094	11, 136, 669

¹ Based on the figures of table 15 using a 25-percent reduction in debt service, assuming authority borrowing but allowing for normal equity requirements.

² This site is not considered further because of the extremely high cost even with possible authority financing shown herein.

Sources of Annual Income

The primary source of annual income is the rent from facilities. Selling land to firms that desire ownership of individual buildings reduces total indebtedness. However, most of the land is assumed to be held by a redevelopment authority until it is ready for development; thus the effect on annual revenue required is minimal. Some additional sources of income are outlined in the last part of this section. In this report, the only income source is the rent charged for facilities. Such rentals depend largely upon the financing methods used.

Any rental charges must be competitive considering the built-in capabilities of the facilities. The estimated rents in this section are based on annual revenue required from each square foot in each food group. Variations in rentals by food group are due to variations in land for expansion,

platform area, and second-floor space, and to similar differences.

The average rentals for facilities range from \$1.65 to \$2.85 per square foot, using private financing and from \$1.30 to \$2.60 per square foot using authority financing (table 17). Rentals in individual buildings which do not have management services would be somewhat lower; such rents are expected to be comparable to rentals paid by food-chain warehouses in the Northeastern States. Rentals for multiple-occupancy buildings include debt service with development costs, real estate taxes, and management services with maintenance.

Some additional income can be obtained from agreements with service organizations for a percentage of the gross income. Such sources include the service station, restaurants, public telephones, and vending machines.

TABLE 17.—*Estimated average annual rentals for wholesale facilities on the Chartiers site*¹

Food group	Proposed space ²	Private financing		Authority financing ³	
		Rent/sq. ft.	Total rent	Rent/sq. ft.	Total rent
	<i>Square feet</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Fresh fruits and vegetables.....	346, 680	2. 30	797, 364	1. 85	641, 358
Meat and meat products.....	709, 750	1. 85	1, 313, 038	1. 55	1, 100, 112
Processed poultry.....	25, 500	1. 65	42, 075	1. 30	33, 150
Groceries.....	1, 175, 000	1. 65	1, 938, 750	1. 30	1, 527, 500
Manufactured dairy products and eggs.....	113, 630	1. 90	215, 897	1. 65	187, 489
Frozen foods.....	137, 470	2. 85	391, 789	2. 60	357, 422
Fishery products.....	40, 250	2. 00	80, 500	1. 70	68, 425
Total or average ⁴	2, 548, 280	1. 87	4, 779, 413	1. 54	3, 915, 456

¹ The average rental based on an accumulation of costs for both multiple-occupancy and individual buildings.

² From table 10, p. 42.

³ Moon Township rentals would average an estimated 5 percent less than Chartiers, but, it may be difficult to obtain authority financing in Moon Township.

⁴ Allied industries are excluded because there is no rent on land until it is developed; however, the debt service costs must be included.

Measurable Benefits and Marketing Cost Reductions in the Proposed Facilities

Development of a modern physical plant capable of efficient terminal processing and distribution operations is the principal reason for proposing a new wholesale food center for Pittsburgh. It is possible to estimate some of the operating savings that could be obtained, but there are other benefits that accrue to market employees, buyers, wholesalers, transportation agencies, farmers, consumers, the city, and the county.

These groups would have economic benefits that would be difficult to measure within the scope of this research; examples of such economic benefits would be time saved in less-congested traffic and more equitable retail food prices for better quality fresh foods.

The total affected costs on the lowest cost location in all food groups indicate a potential saving of \$1,311,200. These estimated savings from

operations in the proposed facilities are based on a comparison with selected marketing costs in existing facilities. These include costs of movement to wholesale facilities and handling within the market area, changes in rents, spoilage, and associated costs, and costs of distribution from wholesalers to retailers.³⁰ An analysis of probable costs in proposed facilities show that an operational saving will result from better management of labor and handling equipment, but rental costs of the new facilities will be greater. If actual construction costs were less than estimated, the savings would be correspondingly greater.

Since the space in the proposed facilities is sufficient to handle all of the present volume (previously discussed on p. 31), costs for receiving, handling, and distribution are based on the same volume in present and proposed facilities. Fewer firms are expected, due to mergers and retirement of older owners, but the volume handled by firms leaving the industry is expected to be handled by the remaining firms.

Cost Reductions in Movement to Wholesale Facilities

The proposed market plan shows rail connections to buildings that will house wholesalers who are expected to receive rail shipments; such connections reduce the necessary cartage from rail cars to wholesale facilities by an estimated 77 percent.³¹ It is assumed that the cartage cost per ton would be the same in the proposed facilities as it is now, because labor, equipment, and distance moved for the remaining cartage volume would be similar. Effective management in the proposed facilities could reduce the total cost of movement to wholesale facilities by using a common platform to receive "pool cars."³² Avoidable delay to inbound trucks would be eliminated in the proposed distribution center because it is designed to accommodate trucks on wide streets.

The only food group with a cartage cost is fresh fruits and vegetables, according to the cost sample.³³ The estimated total cost of cartage in proposed facilities would be \$17,100; the cost is

\$73,900 in present facilities. Thus, a saving of \$56,800 could be realized.

At either the Chartiers or Moon Township location, it will be essential to secure working agreements between major inbound rail carriers to allow switching to house tracks at no additional charge to long-distance rail rates. It is estimated that the cost of switching between major rail carriers in the Pittsburgh terminal area averages \$70 per car. Additional expense would be incurred if switching was not complete within a reasonable time after the scheduled arrival of trains. Schedules should be designed to allow rail cars with food to be placed for unloading in accordance with operating hours of the market. Working agreements must be reached during negotiations for land. Costs of failure to obtain these agreements have not been added in calculating costs on the proposed facilities.

Cost Reductions in Handling Within the Market Area

The largest potential savings from the proposed facilities could accrue from the reduced costs of handling within the facilities; estimated savings are \$1,744,200 (table 18). Labor efficiency can be gained by use of proper handling equipment and techniques of unloading, storage, assembly, and loading in single level buildings with platforms at truckbed level. Whenever it is feasible, variations of the unit-load principle (more than one container on a pallet or handtruck) should be used to attain maximum efficiency (11). All buildings are designed to make maximum usage of the above techniques.

Each wholesaler must attempt to improve the handling operations within his new facilities. Each operation—unloading, moving into the unit, processing, packaging, assembling, and moving into delivery vehicles—must be checked to assure use of the best combination of labor and equipment. For example, one man is more efficient than two men for loading pallets in rail cars. The use of pallets often saves the double handling of products to move them into a position from which they are selected for orders. Unless efficient methods are used in new facilities, the costs could be higher than in present facilities. Too much emphasis cannot be given to making the best use of facilities which are designed for easy movement of products.

In the proposed facilities, reductions occur in the cost of each handling operation. The major cost reductions occur in unloading rail cars, movement within the buildings, and intramarket transfers between wholesalers. The reduction from

³⁰ Tables 23 and 24 at the end of this report give separate costs for operations utilizing present and proposed facilities.

³¹ The basis of this estimated and other estimated charges in this chapter are noted by similar title in the appendix.

³² Pool cars are rail cars whose load is divided among two or more wholesalers when unloaded at destination.

³³ Negligible tonnage (less than 0.5 percent of the volume for each group) was indicated by leaders in each group; specific volumes could not be identified.

intramarket transfers shows the greatest savings. Present transfers involve costly trips across the city; in the proposed center, extensive movements between wholesalers would not be necessary. Most of these savings involve perishables—fruits, vegetables, meat, and dairy products.

TABLE 18.—*Estimated annual handling costs within present and proposed wholesale food facilities*¹

Food group	Total cost ²		Cost reduction
	Present	Proposed	
	1,000 dollars	1,000 dollars	1,000 dollars
Fresh fruits and vegetables.....	1, 811. 8	1, 551. 6	260. 2
Meat and meat products.....	2, 261. 8	1, 832. 5	429. 3
Processed poultry.....	191. 6	75. 0	116. 6
Groceries.....	3, 972. 3	3, 488. 2	484. 1
Manufactured dairy products and eggs.....	818. 0	378. 8	439. 2
Frozen foods.....	147. 1	132. 3	14. 8
Total.....	9, 202. 6	7, 458. 4	1, 744. 2

¹ Costs in this table are a composite of items 7 through 13 in tables 23 and 24.

² Total costs for present and proposed facilities are obtained by slightly different tonnages due to the differences in handling methods described in the detailed cost tabulation in the appendix.

Reduced costs in proposed facilities were computed through research and evaluation of modern distribution operations in other cities and the application of industrial engineering estimates to the necessary operations. The average costs per ton are based on time to handle the product, labor, use of appropriate equipment, and the average size of firm performing the operations; the type of equipment is usually limited by the volume handled by a given firm.

Changes in Rents, Spoilage, and Associated Costs

Rents and Associated Costs.—The estimated annual rentals in proposed facilities are greater than the rentals in existing facilities. These higher rents are offset in most food groups by the operational savings of movement of products. The rentals of proposed buildings are based on the annual revenue previously shown to be required for facilities in each food group, and the revenue required would vary according to the financial arrangements.

The annual total rents are estimated to be higher with either authority financing or private financing than in present facilities (table 19). Increased rents are the price that must be paid for reduced operating costs and improved working conditions. The rents using the authority method of financing are comparable to modern facilities in other cities, and this financing method enables proposed facilities to be self-sustaining.

TABLE 19.—*Estimated annual rent and associated costs in the present and proposed wholesale food facilities*

Food group	Total cost ¹			Increased cost in proposed facilities ³	
	Present	Proposed		Authority financing	Private financing
		Authority financing	Private financing ²		
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Fresh fruits and vegetables.....	783. 6	733. 3	889. 3	— 50. 3	105. 7
Meat and meat products.....	442. 7	1, 207. 9	1, 420. 8	765. 2	978. 1
Processed poultry.....	42. 0	45. 3	54. 2	3. 3	12. 2
Groceries.....	1, 121. 1	1, 828. 6	2, 239. 9	707. 5	1, 118. 8
Manufactured dairy products and eggs.....	169. 4	230. 0	258. 4	60. 6	89. 0
Frozen foods.....	358. 4	503. 6	538. 0	145. 1	179. 5
Total.....	2, 917. 3	4 4, 548. 7	4 5, 400. 8	4 1, 631. 4	4 2, 483. 3

¹ Cost components in this table for present and proposed authority financing include rentals, public warehouse charges, demurrage, and contents insurance, as shown in tables 23 and 24. Proposed private financing is obtained from the total revenue required for 6 food groups.

² From table 17 and appropriate charges in table 24.

³ Minus signs mean that such proposed facilities rentals will be less than present costs.

⁴ Based on the Chartiers site.

Multiple-occupancy buildings will have higher square foot rentals than individual buildings, because such services as market administration, maintenance, and insurance are included. Individual building leases usually allow no benefits beyond the right to occupy and similar lease rights. All multiple-occupancy buildings are assumed to be leased as a group from the developer by the Food Trades Corp. (fig. 32, p. 59). Each individual building is leased separately from the developer.

Rentals for most multiple-occupancy buildings should be approximately \$1.80 per square foot and for individual-occupancy buildings about \$1.10 per square foot, based on a comparison of square footage of each type of space to revenue required for each food group. Rental for multiple-occupancy units for groceries should be approximately \$1.40 per square foot due to elimination of some interior features.

Better space utilization in the new buildings would reduce the requirements for public warehousing. Total reduction in public warehousing costs were an estimated 66 percent; this estimate applied only to foods distributed in the 31-county area. With adequate operating space, both refrigerated and non-refrigerated, demurrage costs are expected to be reduced approximately 90 percent. Because of fewer fire hazards in new buildings, contents insurance should be reduced an estimated 9 percent.

The assumption of lower rentals through an authority, as previously shown, was made because the city and county appear to recognize the necessity of maintaining a vigorous wholesale food distribution industry close to the center of distribution for the region. This recognition and willingness to implement favorable industry conditions should lead to more reasonable tax assessments and support in the financial methods for the proposed facilities. Inasmuch as proposed authority rentals are comparable to other new markets, they were used in the rent calculations in the detailed cost tabulations in the appendix.

Spoilage and Associated Costs.—Costs of spoilage can be substantially reduced in the proposed facilities, if such facilities are properly used. Assuming that refrigeration will be installed in facilities handling perishables, and that exposure of perishables to the elements will be less prevalent, spoilage should be reduced. Less handling combined with use of methods that reduce impact on merchandise will reduce breakage, bruising, and deterioration. Improved layout in proposed buildings should yield better controls over the inventory to reduce pilferage and allow better first-in-first-out practices with merchandise. Cost re-

ductions used in these calculations are based upon the experience of wholesalers in improved facilities in other cities.

Pittsburgh has a unique situation in that costs connected with spoilage are increased by the use of rail cars for a substantial portion of the refrigeration facilities for perishables. Such use of rail cars adds the costs of car icing and switching.

The total cost of spoilage and car icing and switching was \$2,140,900 in present facilities; this could be reduced to \$1,228,900 in proposed facilities and \$912,000 would be saved (table 20).

TABLE 20.—*Estimated annual spoilage and associated costs, by food group, for the present and proposed wholesale food facilities*

Food group	Total cost ¹		Cost difference— present vs. proposed
	Present	Proposed ²	
	1,000 dollars	1,000 dollars	1,000 dollars
Fresh fruits and vegetables.....	820. 9	359. 0	461. 9
Meat and meat products.....	940. 7	541. 4	399. 3
Processed poultry.....	32. 4	16. 2	16. 2
Groceries.....	262. 1	251. 0	11. 1
Manufactured dairy products and eggs..	54. 6	37. 6	17. 0
Frozen foods.....	30. 2	23. 7	6. 5
Total.....	2, 140. 9	1, 228. 9	912. 0

¹ Cost components in this table include spoilage and car icing and switching.

² This cost in proposed facilities would be the same regardless of the financing method used.

Cost Reductions in Distribution From Wholesalers to Retailers

Distribution costs will depend on the site location and its relation to volumes destined for various parts of the city and surrounding counties. For the two sites with lowest total costs, delivery costs are based upon travel times, truck, and labor costs during the year of the study. The Chartiers site would cost \$229,600 less than the present distribution, and the Moon Township site would cost \$63,300 more than the present distribution (table 21). From a redeveloped Strip area, most of the avoidable delay to outbound trucks would be eliminated; thus, distribution costs would be an estimated \$211,100 less than present costs. Such savings on the Strip site would not overcome land costs.

TABLE 21.—*Estimated annual costs of distribution from the present and proposed wholesale food facilities, by food group*¹

Food group	Present total cost	Chartiers		Moon Township	
		Proposed total cost	Difference—present vs. proposed	Proposed total cost	Difference—present vs. proposed
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables.....	3, 184. 9	2, 907. 9	277. 0	2, 985. 9	199. 0
Meat and meat products.....	1, 800. 8	1, 812. 1	² -11. 3	1, 855. 2	-54. 4
Processed poultry.....	119. 8	122. 6	-2. 8	130. 5	-10. 7
Groceries.....	3, 651. 8	3, 677. 2	-25. 4	3, 815. 5	-163. 7
Manufactured dairy products and eggs.....	493. 0	498. 7	-5. 7	517. 1	-24. 1
Frozen foods.....	326. 4	328. 6	-2. 2	335. 8	-9. 4
Total.....	³ 9, 576. 7	9, 347. 1	229. 6	9, 640. 0	-63. 3

¹ Components of cost comparisons are shown in detail in items 21 through 29 in tables 23 and 24. Table 24 has 2 sections, 1 each for the Chartiers and Moon Township sites.

² A minus sign indicates a greater cost than the present facilities due to greater time spent in travel.

³ This figure represents the cost of all foods handled in the present market because space in the proposed market will be sufficient to handle the total volume. (See p. 31).

Highway networks proposed for the late 1960's would reduce total distribution costs an estimated 5 to 8 percent using comparable equipment and labor. It is assumed that labor costs in trucking, which are presently somewhat lower for all of Allegheny County than in the city of Pittsburgh, would tend to equalize over a period of time.

Summary of Estimated Savings

With financing through an authority and land obtained by an urban redevelopment authority, an estimated saving of \$1,311,200 for all commodities

should be realized on the Chartiers site (table 22). If the Moon Township site were used, the estimated savings would be \$1,018,300. This difference is due to higher distribution costs from the Moon Township site.

If the proposed facilities were privately financed, it is estimated that there would be no savings. On the Chartiers site, costs would be expected to increase approximately \$242,400; on the Moon Township site, costs would probably be \$535,400 greater than in present facilities. Such increases are due primarily to high debt service charges.

TABLE 22.—*Summary of estimated annual operating costs and savings for all commodity groups on the 2 lowest cost proposed wholesale food market sites*¹

Type of movement	Present facilities	Proposed facilities			
		Chartiers		Moon Township	
		Authority financing	Private financing	Authority financing	Private financing
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Movement to market from first point of arrival...	73. 9	17. 1	17. 1	17. 1	17. 1
Costs within the market.....	14, 260. 8	13, 236. 0	² 14, 789. 7	13, 236. 0	² 14, 789. 7
Distribution from the market.....	9, 576. 7	9, 347. 1	9, 347. 1	9, 640. 0	9, 640. 0
Total cost.....	23, 911. 4	22, 600. 2	24, 153. 8	22, 893. 1	24, 446. 8
Savings by operation in proposed facilities.....		1, 311. 2	³ -242. 4	1, 018. 3	-535. 4

¹ Cost figures in this table are excerpts from all commodity totals in tables and in the appendix unless otherwise indicated.

² This figure is derived by subtracting the 6 food groups

rentals total (\$3,847,100 on line 14, table 24) from the section subtotal (\$13,236,000); then the rent for comparable food groups (table 17) is added.

³ Minus indicates an additional cost.

The estimated annual savings using either financing method do not include expenditures that wholesalers must make to equip the interior of new facilities. However, such expenditures will not involve all new equipment; some of the refrigeration equipment, conveyors, handtrucks, and office equipment in existing facilities could be used in proposed facilities.

Potential Savings From Alternative Transportation Operations

Improved handling operations have been previously presented and their benefits have been estimated. However, there are improvements in transportation which cannot be estimated because the control of these systems does not rest with the wholesalers. Evidence of the systems described in the following paragraphs has been noted in Pittsburgh, and increased use of improved transportation will probably accompany facilities improvements.

Greater use of rail cars with built-in materials-handling systems give food wholesalers an opportunity for additional savings; for example, rail cars with automatic belt and conveyors for loading and unloading. A similar opportunity for savings is in the use of refrigerated containers for mixed loads. Such containers, weighing 1 to 2 tons when filled, can be unloaded from rail cars or trucks by forklift trucks, which will take them to points within the facilities.

Recent advances in the development of truck trailers on rail cars (piggyback) could prove economical to food wholesalers considering pos-

sible savings in time, space, and rail charges. Since the late 1950's increasing volumes have been shipped by piggyback from production areas in the Southeast, Southwest, and Northwest to terminal areas in the Midwest and Northeast. During the growing season, special all-produce trains have been dispatched from the Southeast to the Northeast. Piggyback cars from Southeastern States could be switched out of Washington, D.C., to fast trains for second-day delivery in Pittsburgh. Trains coming through Chicago and St. Louis could use those cities for switching piggyback cars carrying food to Pittsburgh.

It is estimated that piggyback traffic from the Southern States to Pittsburgh would cost approximately \$370 per trailer, including freight and refrigeration charges. Such costs are approximately \$100 less than refrigerated rail cars.³⁴

A few large-volume food wholesalers may obtain slight savings by scheduling trailers to final destinations without going through warehousing facilities. However, the greatest saving is expected to be in lower cartage and handling costs to wholesale facilities, because most trailers will be unloaded at wholesale facilities for easy re-assembly into retail orders. Railroad facilities to remove the trailers from rail cars should be convenient to the proposed market to maximize savings.

New aircargo systems have recently been developed for high tonnage with automatic handling systems. Lower rates being considered for these systems by ICC would be competitive with surface transportation of many perishable products.

Nonmeasurable Benefits of a Modern Food Distribution Center

In addition to the measurable benefits, there are numerous benefits which cannot be measured readily in dollars. These hard-to-measure economic and social benefits would accrue not only to food wholesalers, but to wholesale buyers, consumers, market employees, agricultural producers, transporters, and the local governments.

To Wholesalers.—Total operating hours for wholesalers could be reduced, and these hours more easily unified into a better sales day for the owner-operators and all employees. At either of the low-cost sites, it is likely that increased volumes from sales outside of Allegheny County would be forthcoming, particularly if such business were actively solicited. Many operators no longer would find it necessary to continue operations in several loca-

tions; and if wholesalers grasped the advantages offered for more efficient operation in improved facilities, their competitive position could be improved. The composite of these physical plant developments and the psychological reaction to better surroundings should increase prestige and give the potential for increased monetary returns through increasing services and probably volume.

To Buyers.—In a consolidated market, buyers could purchase supplies more satisfactorily in less time than they require in the present scattered market. An efficient local communications sys-

³⁴Tariff estimates were obtained from the Baltimore & Ohio Railroad and Pennsylvania Railroad for plan II operations (railroads carry their own trailers), assuming two trailers per rail car.

tem would enable rapid assembly of all the purchased items for transport to the buyers' point of business. Truck loading would have no interference from congested streets, parking areas, and sidewalks. The hours spent in buying would tend to be effectively reduced. The quality of fresh foods could be maintained due to better handling and less deterioration from avoidable delays. The overall satisfaction derived by buyers using improved facilities would tend to increase the volume handled through these facilities.

To Consumers.—Within the 31 counties of the Pittsburgh distribution area, consumers would be able to get perishable foods in better condition. Given the opportunity, housewives would probably purchase slightly more or better quality foods on the same budget. All foods and groceries could be reasonably priced because marketing savings could be passed on proportionately to the consumer.

To Farmers.—Agricultural producers from the area around Pittsburgh would have a relatively permanent and more profitable location for their combination wholesale-retail market. Plans for redevelopment in the North Side will force the farmers to vacate their present location. Suggested facilities are on the wholesale market adjacent to the primary highway; thus they can readily draw their retail trade and lessen cartage cost for the volume moving into wholesale channels. The highway network would reduce travel-time, allowing more prompt unloading and return to the farm.

Producers from more distant places might obtain a slightly larger percent of the marketing dollar due to the efficiencies gained by wholesalers. Assuming that transportation charges are usually borne by producers, such charges could be lower, particularly where growers' trucks were used.

To Market Employees.—Working conditions for employees handling food would be improved in new marketing facilities. Since the buildings are designed for efficient handling by proper equipment, the workers' tasks would be less arduous, their productivity should be increased, and over a period of time their hourly wages might be expected to increase. Regular work-hours could be more easily arranged, and irregular employment could be lessened. Unemployed loiterers could be more easily controlled. Coupled with previously mentioned advantages, morale and temperament of employees would be better. New facilities with many conveniences not available at

present would improve the general environment.

To Transporters.—Both rail and truck firms will obtain advantages in the proposed marketing facilities. Truck delays and unnecessary handling which affect inbound and outbound vehicles will be minimized, because the market will have wide uncongested streets and platforms.

Railroads serving the Strip area are not able to unload merchandise at the operating location of many wholesalers. When rail rates are added to the cartage cost from terminal arrival point to the wholesaler's operating location, total shipping cost from production point to market may be higher than direct truck charges. Cartage from arrival point to the wholesaler usually is accomplished under conditions which lower the quality of perishable foods. If the facilities suggested in the report were constructed, railroads would benefit in three important ways: (1) They would be able to place cars beside wholesalers' units with platforms at car-bed level; thus unloading would be comparable to direct truck receiving. (2) The consolidation of marketing facilities into one area would provide an opportunity for the railroads to obtain greater returns from facilities in the immediate area. (3) As a modern expanded service, the food distribution center would enable the establishment of a piggyback car unloading point in an area with high potential for such service.

To the Municipalities.—The construction of new wholesale food marketing facilities may benefit local governments in several ways: (1) The removal of food wholesaling operations from the blighted areas, where many such firms are located, would enable better redevelopment of the area. (2) The transfer of food wholesaling operations to modern facilities would assist the enforcement of sanitation and fire regulations, and lessen crime in the area. (3) The acute traffic problem in the Strip area would be relieved. (4) The proposed new marketing facilities would pay annual taxes of several hundred thousand dollars. Taxes from the redeveloped Strip area and smaller areas in East Pittsburgh should be higher due to a better tax base. (5) Indirect financial returns should accrue from increased volume that will move through the proposed food marketing center. Expanded services offer greater prosperity for allied industries. (6) With some financing systems, the city might own facilities worth more than the investment after the indebtedness had been retired.

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APPENDIX

Determining Volume, Distribution, and Marketing Costs for Present and Proposed Facilities

Detailed cost comparisons of handling food through wholesale facilities are developed in table 23 for the present market and in table 24 for the proposed market in the two lowest cost locations—Chartiers and Moon Township. These tables are designed to follow operations in order of occurrence with volume and costs for each food group. The same volume handled during the study year was assumed in deriving costs for proposed facilities, because firms handling 86 percent of the volume should have new facilities. The space provided for these firms would be capable of handling the total volume found in the study if facilities were utilized to near maximum capacity.

Determining Volume

To compute the total cost of handling and transporting, it was necessary first to determine the total volume of each of the food groups arriving at various points in Allegheny County. These data were collected by interviewing all wholesale food firms. The survey volumes were checked with (1) market news reports from several AMS divisions, (2) food consumption data, (3) and reports of local agencies in Allegheny County.

Establishing the Flow Patterns

After the volumes were obtained, a sample of 82 firms was used to determine the percentage of products physically transferred from the point of arrival in the county through various channels to the retailer. This sample was stratified to obtain data from the top three firms by volume in each food group, and fewer firms were used for lower volume levels. Actual destinations of food products were obtained from sales invoices of firms in the sample based on 1 week in 4 different months. Patterns that developed in examining the invoices were checked with the management of sampled wholesalers. Flow patterns were developed for each food group showing (1) the volumes arriving at facilities by different methods, (2) the movement between wholesalers, (3) and the flow of products to retailers in various areas served by wholesalers in the Pittsburgh market area.

Relation of Centers of Distribution and Population

The center of distribution was developed to show the geographical scope of operations for wholesalers in Allegheny County. The centers of population based on selected census years were determined for the 31 counties to which these wholesalers distribute. The total population of these counties represents an approximation of the potential market for Allegheny County wholesalers. This distribution area regularly served is geographically larger than the area served by many terminal markets. Therefore, the distance between these calculated centers could be greater than that for many other cities.

Determining Marketing Costs

The marketing costs were obtained from firms in the previously mentioned sample to show measurable handling operations for each food group at each step in the flow pattern. These marketing costs are computed for present and proposed facilities to estimate the potential savings in improved facilities. Many costs from financial records in existing operations were checked by time studies. Handling and cartage costs include labor and equipment, but management costs are deleted due to variances which depend on the size of firms and management's share of returns. All costs of each operation are the average cost for all wholesalers—purveyor, jobber, food-chain warehouse, and other firms with mixed functions. Charges are allocated to each operation without regard to who paid the charge. For example, loading delivery trucks may involve both buyer's and seller's labor, but this appears as one cost for loading.

Marketing costs in proposed facilities were based on the average costs for selected operations in other cities with modern facilities and handling methods. These average costs are corrected for the study year in Pittsburgh by Bureau of Labor Statistics indices and compared with actual wage rates. Some adjustments were made for equipment changes.

Labor Costs.—Most of the workers handling food and associated products in Pittsburgh are unionized, and wages are based on the skills required to perform specific operations. Truck-drivers, warehousemen, and meatcutters are typical general classifications. For purposes of this report, wages for all of the operations required in each handling function listed in the following tables were averaged for each food group. These wages were obtained from the union-labor contracts in use by firms in the previously mentioned sample.

Truck Costs.—These costs are based on trucks whose functions are moving products from points of arrival to wholesalers, intramarket transfer, and delivery from facilities in the Pittsburgh area to retailers. No long-distance hauling to or from points which are hundreds of miles away were calculated. These costs are an average from three truck lease companies of basic items including the vehicle, insurance, gasoline, oil and other supplies, licenses, and repairs. These leasing companies are very competitive. Their total annual cost per mile appears to be lower or equal to costs where wholesalers own the trucks because maintenance costs are lower.

Handling Equipment Costs.—These costs are based on an average life expectancy of 10 years for handling equipment, except 6.3 years for batteries used as a power source in some handling equipment (based on Internal Revenue Service Schedule of Depreciation "F"). Other costs include interest on equipment investment, tax, maintenance, gasoline, and oil. The sum of these average costs obtained from companies servicing materials-handling equipment are converted to a cost per year for each piece of equipment.

Detailed Cost Tabulations

The purpose of these notes is to define the limitations of the analysis in tables 23 and 24. The numbers prefacing the following paragraphs correspond to the item numbers on the stub of each table. Costs for labor, trucks, and handling equipment in each of the following items are determined as described in the preceding sections of the appendix. Costs per ton in each of the following items are obtained by dividing total costs for an operation by the volume included in the operation.

1. Cartage from team tracks includes only the volume moved from the first point of arrival to wholesalers' facilities before the first wholesale transaction. The charge includes truck costs, labor on the vehicle, and unloading the rail car. Often such cartage is performed by trucking companies on a per package basis; avoidable delay to these vehicles is in the package transfer cost. In

proposed facilities this cost is reduced by increased use of house tracks.

2. Avoidable delay to inbound trucks is primarily a congestion problem of moderate proportion in Pittsburgh. Short waiting times at individual firms are not considered avoidable (16). In new facilities, this cost could be eliminated.

3 and 5. Volumes indicated under these items arrive at the wholesalers' facilities by truck or rail without any intermediate handling. Hence, the first applicable costs are unloading, shown in items 7 and 8.

4. Products of local origin include the wholesale volume of the farmers' market, animals slaughtered within the county, and groceries or frozen foods processed into edible form for distribution within the area.

5. See item 3.

6. Sales from team tracks and tailgates reflect volumes inbound to the market area, but not handled through wholesale facilities before the first wholesale transaction. Costs are shown as handling operations in items 11 and 12; the cost is composed primarily of labor in transferring products from one vehicle directly to another. Usually a simple materials-handling method is used; for example, roller conveyors or two-wheel handtrucks.

7 and 8. Unloading is defined as the handling operations, including labor and equipment, necessary to remove the product from the inbound vehicle. Equipment such as pallets, handtrucks, and lifts are usually considered warehouse property, but equipment costs for unloading are allocated to this operation for actual time used. In present facilities, some food groups experience high unloading costs for rail volume because of unusual labor contract requirements. Proposed facilities would allow establishment of new contracts without having established precedence to hinder efficient operations. Volumes in present and proposed facilities differ slightly due to anticipated changes in transport mode.

9. Handling within a warehouse or assembly area includes the per ton costs of equipment and labor for movement from inbound vehicles to holding space, processing, order assembly, and movement to the delivery vehicle.

10. The cost per ton of loading delivery vehicles includes labor and equipment costs from the point where the load is assembled until it is placed in the truck. Labor includes warehousemen and drivers as applicable with labor contracts for each firm.

11 and 12. See item 6.

13. Intramarket transfers are the foods that physically are handled or transferred between two

TABLE 23.—Estimated annual costs of moving 6 food groups through the present Pittsburgh wholesale distribution facilities

Item 1	Fruits and vegetables			Meat and meat products			Processed poultry			Groceries			Manufactured dairy products and eggs			Frozen foods			Totals or averages		
	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2	Vol- ume 2	Aver- age cost per ton 3	Total cost 2
Movement to wholesaler																					
Carriage and delay costs:																					
1. Cartage from team tracks....	18.6	2.75	51.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.6	2.75	51.2
2. Available truck delay— inbound.....	4 (18.4)	1.23	22.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(18.4)	1.23	22.7
Subtotal or average.....	18.6	3.97	73.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18.6	3.97	73.0
No cartage costs (direct unloads):																					
3. Trucks from shipping points (excludes truck tailgate sales).....	240.1	0	0	21.1	0	0	13.5	0	0	422.7	0	0	47.4	0	0	10.5	0	0	755.3	0	0
4. Local origin (including farm- er's market receipts).....	7.7	0	0	78.6	0	0	0	0	0	5.2	0	0	0	0	0	12.1	0	0	103.6	0	0
5. Rail cars on house tracks (ex- cludes team track sales).....	190.4	0	0	35.7	0	0	0	0	0	199.4	0	0	13.3	0	0	7.0	0	0	445.8	0	0
6. Sales from team tracks and tailgates.....	80.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80.3	0	0
Subtotal or average.....	518.5	0	0	135.4	0	0	13.5	0	0	627.3	0	0	60.7	0	0	29.6	0	0	1,385.0	0	73.9
Total or average cartage to facility.....	537.1	.14	73.9	135.4	0	0	13.5	0	0	627.3	0	0	60.7	0	0	29.6	0	0	1,403.6	.05	73.9
Handling and other cost in market area																					
Handling costs (includes labor and equipment):																					
7. Unloading trucks into war- house.....	(247.8)	.76	188.9	(14.7)	1.34	19.7	(13.5)	1.86	25.1	(423.1)	1.32	556.5	(47.1)	1.62	76.8	(10.5)	1.28	13.5	(757.0)	1.16	880.5
8. Unloading rail cars from house tracks.....	(190.4)	1.55	295.1	(14.5)	1.34	19.5	0	0	0	(194.4)	1.39	270.9	(13.3)	1.62	21.7	(7.0)	2.28	16.0	(419.6)	1.48	623.2
9. Handling within warehouse.....	(456.7)	.70	318.0	(107.8)	15.60	1,681.3	(13.5)	0.80	132.0	(617.7)	3.73	2,304.8	(60.7)	6.60	401.0	(17.6)	4.70	82.0	(1,274.0)	3.86	4,919.6
10. Loading delivery trucks at warehouse.....	(456.7)	1.13	517.6	(107.8)	1.93	208.0	(13.5)	2.56	34.5	(617.7)	1.36	840.1	(60.7)	3.14	190.8	(17.6)	1.88	33.0	(1,274.0)	1.43	1,824.0
11. Team track sales.....	(61.9)	1.20	74.2	(21.2)	2.00	42.4	0	0	0	0	0	0	0	0	0	0	0	0	(83.1)	1.40	116.6
12. Tailgate sales.....	(18.4)	1.20	22.0	(6.4)	2.00	12.8	0	0	0	0	0	0	0	0	0	0	0	0	(24.8)	1.41	34.8
13. Intramar-set transfer.....	(73.8)	5.37	396.0	(12.0)	23.24	278.1	0	0	0	0	0	0	(8.7)	14.73	127.7	(.2)	12.52	2.1	(94.7)	8.50	803.9
Subtotal or average.....	537.1	3.37	1,811.8	135.4	16.71	2,261.8	13.5	14.22	191.6	627.3	6.33	3,972.3	60.7	13.47	818.0	29.6	4.97	147.1	1,403.6	6.56	9,202.6
Rent, spoilage, and associated costs:																					
14. Rentals.....	(530.5)	1.09	578.7	(119.7)	2.75	328.9	(13.5)	2.13	28.7	(617.7)	1.15	712.4	(60.7)	1.81	110.0	(17.7)	4.47	79.3	(1,359.8)	1.35	1,838.0
15. Public warehouse charges.....	0	0	0	0	0	0	0	0	0	(10.0)	8.00	79.9	0	0	0	(12.1)	20.00	241.0	(22.1)	14.56	320.9
16. Demurrage.....	(270.9)	.43	116.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(270.9)	.43	116.7
17. Car icing.....	(255.3)	.78	198.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(255.3)	.78	198.0
18. Spoilage.....	(537.1)	1.11	598.2	(135.4)	6.95	940.7	(13.5)	2.40	32.4	(627.3)	.42	262.1	(60.7)	.90	54.6	(29.6)	1.02	30.2	(1,403.6)	1.28	1,918.2
19. Content insurance.....	(530.5)	.17	88.2	(119.7)	.95	113.8	(13.5)	.99	13.3	(627.3)	.52	328.8	(69.4)	.86	59.4	(29.6)	1.29	38.2	(1,390.0)	.46	641.7
20. Switching.....	(30.9)	.79	24.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(30.9)	.79	24.7
Subtotal or average.....	537.1	2.99	1,604.5	135.4	10.22	1,383.4	13.5	5.53	74.4	627.3	2.20	1,383.2	60.7	3.68	224.0	29.6	13.13	388.7	1,403.6	3.60	5,058.2
Total or average for han- dling and other costs.....	537.1	6.36	3,416.3	135.4	26.93	3,645.2	13.5	19.74	266.0	627.3	8.54	5,355.5	60.7	17.16	1,042.0	29.6	18.09	535.8	1,403.6	10.16	14,260.8

Carriage and other costs from market area

To retail and other users in Allegheny County:

21. Central	3.76	225.6	20.2	7.84	158.3	4.1	7.37	29.8	63.7	4.15	264.7	12.1	5.09	61.5	3.8	6.52	24.4	163.9	4.66	764.3
22. North Side	53.6	245.2	16.3	10.89	177.8	2.6	9.80	25.6	69.8	4.93	344.5	8.3	7.90	65.3	2.9	9.67	27.5	153.5	5.77	885.9
23. South Side	32.3	131.4	10.5	8.66	90.7	1.5	8.06	12.4	57.3	4.07	233.2	5.5	5.85	32.1	2.4	6.12	4.6	110.5	4.66	514.4
24. South Hills	57.3	270.5	23.0	11.84	272.9	2.3	9.07	20.5	96.6	5.20	502.0	9.4	8.24	77.6	3.2	9.57	30.9	191.9	6.12	1,175.3
25. East Side	59.2	310.7	19.8	11.29	223.2	3.0	10.42	31.5	79.2	5.05	399.6	8.6	8.42	72.8	3.3	9.86	32.1	173.1	6.18	1,069.9

Subtotal or average.....

To destinations outside Allegheny County:

26. Other western Pennsylvania counties	263.5	4.49	1,183.4	89.8	10.28	922.9	13.5	8.89	119.8	4.76	1,744.9	43.9	7.05	309.3	15.6	9.38	129.5	792.9	5.56	4,409.8
27. Ohio and West Virginia counties	165.5	7.02	1,161.4	42.8	19.04	814.5	0	0	0	7.36	1,288.1	12.0	11.25	135.5	9.0	15.41	141.8	404.5	8.75	3,541.3
28. All other destinations	68.9	8.93	597.5	2.8	22.94	63.4	0	0	0	9.00	618.8	3.9	12.48	48.2	3.0	18.28	55.1	145.3	9.52	1,363.1
	41.2			0			0					.9			2.0			60.9		

Subtotal or average.....

29. Avoidable delay to outbound trucks.....

	273.6	6.43	1,758.9	45.6	19.25	877.9	0	0	0	7.31	1,906.9	16.8	10.93	183.7	14.0	14.06	196.9	610.7	8.06	4,924.3
	(310.8)	.40	242.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(610.8)	.40	242.6

Total or average for outbound cartage.....

	537.1	5.93	3,184.9	135.4	13.30	1,800.8	13.5	8.89	119.8	5.82	3,651.8	60.7	8.12	493.0	29.6	11.03	326.4	1,403.6	6.82	9,576.7
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Grand total or average.....

	537.1	12.42	6,675.1	135.4	40.23	5,446.0	13.5	28.63	385.8	14.35	9,007.3	60.7	25.29	1,535.0	29.6	29.13	862.2	1,403.6	17.04	23,911.4
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¹ Explanation of terms given on pages preceding this table.

² Volume and total cost estimates are rounded to the nearest hundred after complete figures were

³ Cost per ton is rounded to the nearest cent after dividing total costs by volume in tons.

⁴ Figures in parentheses are not included in totals because they are a part of other items.

TABLE 24.—Estimated annual costs of moving 6 food groups through proposed wholesale distribution facilities for Pittsburgh

Item ¹	Fruits and vegetables			Meat and meat products			Processed poultry			Groceries			Manufactured dairy products and eggs			Frozen foods			Totals or averages		
	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²	Vol- ume ²	Aver- age cost per ton ³	Total cost ²
Movement to wholesaler																					
Cartage and delay costs:																					
1. Cartage from team tracks:	1,000 tons	Dollars 2.75	17.1																		
2. Available delay to trucks:	6.2 0	0	0																		
Subtotal or average:	6.2	2.75	17.1																		
No cartage costs (direct unloads):																					
3. Truck from shipping point:	240.1	0	0	21.1	0	0	13.5	0	0	422.7	0	0	47.4	0	0	10.5	0	0	755.3	0	0
4. Local origin:	7.7	0	0	78.6	0	0	5.2	0	0	5.2	0	0	13.3	0	0	12.1	0	0	103.6	0	0
5. Rail cars on house tracks:	242.9	0	0	35.7	0	0	0	0	0	199.4	0	0	0	0	0	7.0	0	0	498.3	0	0
6. Sales from team tracks and tailgates:	40.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40.2	0	0
Subtotal or average:	530.9	0	0	135.4	0	0	13.5	0	0	627.3	0	0	60.7	0	0	29.6	0	0	1,397.4	0	0
Total or average:	537.1	.03	17.1	135.4			13.5			627.3			60.7			29.6			1,403.6	.01	17.1
Handling and other costs in market area																					
Charlerters rentals—handling costs:																					
7. Unloading trucks into ware-																					
house:	4(247.8)	.74	183.4	(14.7)	.79	11.5	(13.5)	1.57	21.4	(423.1)	1.06	448.1	(47.4)	1.08	51.2	(10.5)	.90	9.5	(757.0)	.96	725.2
8. Unloading rail cars from	(242.9)	.82	199.2	(14.5)	.79	11.5	0	0	0	(194.4)	1.09	211.9	(13.3)	1.09	14.5	(7.0)	1.60	11.2	(1,472.1)	.31	448.3
house tracks:	(490.6)	.72	353.3	(107.8)	12.60	1,358.0	(13.5)	2.10	28.3	(617.5)	3.48	2,148.7	(60.7)	2.40	145.7	(17.6)	4.60	80.8	(1,307.7)	3.15	4,114.8
9. Unloading within warehouse:																					
10. Loading delivery trucks at	(490.6)	1.08	529.9	(107.8)	1.83	197.2	(13.5)	1.90	25.3	(617.5)	1.10	679.5	(60.7)	1.90	115.4	(17.6)	1.70	29.8	(1,307.7)	1.21	1,577.1
warehouse:	(26.8)	1.20	32.2	(21.2)	1.95	41.3	0	0	0	0	0	0	0	0	0	0	0	0	(48.0)	1.53	73.5
11. Team track sales:	(13.4)	1.20	16.1	(6.4)	1.95	12.4	0	0	0	0	0	0	0	0	0	0	0	0	(19.8)	1.44	28.5
12. Tailgate sales:	(73.8)	3.22	237.5	(12.0)	16.75	200.5	0	0	0	0	0	0	(8.7)	5.98	52.0	(.2)	6.00	1.0	(94.7)	5.19	491.0
13. Intramarket transfers:																					
Subtotal or average:	537.1	2.89	1,551.6	135.4	13.54	1,832.5	13.5	5.53	75.0	627.3	5.62	3,488.2	60.7	6.24	378.8	29.6	4.43	132.3	1,403.6	5.31	7,458.4
Rent, spillage, and associated costs:																					
14. Rentals (est.):	(530.5)	1.21	641.4	(119.7)	9.19	1,100.1	(13.5)	2.46	33.2	(617.7)	2.47	1,527.5	(60.7)	3.09	187.5	(23.8)	15.02	357.4	(1,365.9)	2.82	3,847.1
15. Public warehouse charges:	0	0	0	0	0	0	0	0	0	(10.0)	0	0	0	0	0	(6.0)	18.00	108.0	(12.1)	9.00	108.0
16. Demurrage:	(25.0)	.49	12.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(25.0)	.49	12.3
17. Car lading:	(20.0)	.78	15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(20.0)	.78	15.6
18. Spillage:	(537.1)	.61	327.6	(135.4)	4.00	541.4	(13.5)	1.20	16.2	(627.3)	.40	251.0	(60.7)	.62	37.6	(29.6)	.80	23.7	(1,403.6)	.83	1,197.5
19. Content insurance:	(530.5)	.15	79.6	(120.0)	.90	107.8	(13.5)	.90	12.1	(627.3)	.48	301.1	(60.7)	.70	42.5	(29.6)	1.29	38.2	(1,381.6)	.42	581.3
20. Sweeping:	(20.0)	.79	15.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(20.0)	.79	15.8
Subtotal or average:	537.1	2.03	1,092.3	135.4	12.92	1,749.3	13.5	4.56	61.5	627.3	3.32	2,079.6	60.7	4.41	267.6	29.6	17.81	527.3	1,403.6	4.12	5,777.6
Total or average:	537.1	4.92	2,943.9	135.4	26.45	3,581.8	13.5	10.11	136.50	627.3	8.88	5,507.8	60.7	10.65	646.4	29.6	22.28	659.6	1,403.6	9.43	13,236.0
CHARTERS																					
Cartage and other costs from market																					
To retail and other users in Allegheny County:																					
21. Central:	60.0	4.11	246.7	20.2	8.38	169.2	4.1	7.91	32.0	63.7	4.56	290.8	12.1	5.52	66.7	3.8	6.99	26.2	163.9	5.07	831.6
22. North Side:	53.6	4.72	252.8	16.3	11.10	181.2	2.6	10.01	26.1	69.8	5.09	356.0	8.3	8.07	66.7	2.8	9.85	28.0	153.5	5.93	910.8
23. South Side:	33.3	3.87	128.6	10.5	8.54	89.4	1.5	7.94	12.2	57.3	3.98	228.3	5.5	5.75	31.6	2.4	6.01	14.4	110.5	4.57	504.5
24. South Hills:	57.4	2.86	164.0	23.0	11.32	260.9	2.3	8.55	19.3	96.6	4.80	403.8	9.4	7.83	73.7	3.2	9.12	29.5	191.9	5.27	1,011.2
25. East Side:	59.2	5.57	330.0	19.8	11.81	233.5	3.0	10.94	33.0	79.2	5.45	431.4	8.6	8.83	76.3	3.3	10.31	33.6	173.1	6.57	1,137.8
Subtotal or average:	263.5	4.26	1,122.1	89.8	10.40	934.2	13.5	9.14	122.6	366.6	4.82	1,770.3	43.9	7.18	315.0	15.6	8.51	131.7	792.9	5.54	4,395.9

To destinations outside Allegheny County:

26. Other western Pennsylvania counties-----	165.5	7.02	1,161.4	42.8	19.04	814.5	0	0	0	175.2	7.36	1,288.1	12.0	11.25	135.5	9.0	15.41	141.8	404.5	8.75	3,541.3
27. Ohio and West Virginia counties-----	66.9	8.93	597.5	2.8	22.94	63.4	0	0	0	68.7	9.00	618.8	3.9	12.48	48.2	3.0	18.37	55.1	145.3	9.52	1,383.0
28. All other destinations-----	41.2	0	0	0	0	0	0	0	0	16.8	0	0	.9	0	0	2.0	0	0	60.9	0	0
Subtotal or average-----	273.6	6.43	1,758.9	45.6	19.27	877.9	0	0	0	260.7	7.32	1,906.9	16.8	10.92	183.7	14.0	13.96	196.9	610.7	.806	4,924.3
29. A voidable delay—outbound-----	537.1	.05	26.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(537.1)	.05	26.9
Total or average-----	537.1	5.41	2,907.9	135.4	13.39	1,812.1	13.5	9.11	122.6	627.3	5.86	3,677.2	60.7	8.06	498.7	29.6	11.10	328.6	1,403.6	6.66	9,347.1
Grand total or average-----	537.1	10.37	5,568.9	135.4	39.84	5,393.9	13.5	19.19	259.1	627.3	14.74	9,245.0	60.7	18.86	1,145.1	29.6	33.39	988.2	1,403.6	16.10	22,600.2

MOON TOWNSHIP

Cartage and other costs from markets to retail and other users in Allegheny County:																					
21. Centre-----	60.0	4.48	268.9	20.2	8.96	181.0	4.1	8.49	34.3	63.2	5.01	319.7	12.1	5.98	72.2	3.8	7.49	28.0	163.9	5.52	904.1
22. North Side-----	53.6	5.00	268.5	16.3	12.09	197.3	2.6	11.00	28.7	69.8	5.85	409.1	8.3	8.86	73.3	2.9	10.71	30.5	153.5	6.56	1,007.4
23. South Side-----	33.3	4.50	149.5	10.5	9.52	99.7	1.5	8.92	13.7	57.3	4.73	271.3	5.5	6.53	35.9	2.4	6.86	16.4	110.5	5.31	586.5
24. South Hills-----	57.4	2.66	152.4	23.0	10.84	249.8	2.3	8.07	18.3	96.6	4.43	428.1	9.4	7.45	70.1	3.2	8.71	28.1	191.9	49.33	946.8
25. East Side-----	59.2	6.09	360.8	19.8	12.62	249.5	3.0	11.75	35.5	79.2	6.07	480.4	8.6	9.48	81.9	3.3	11.01	35.9	173.1	70.72	1,244.0
Subtotal or average-----	263.5	4.56	1,200.1	89.8	10.88	977.3	13.5	9.68	130.5	366.6	5.20	1,908.6	43.9	7.59	333.4	15.6	8.98	138.9	792.9	5.91	4,688.8

To destinations outside Allegheny County:

26. Other western Pennsylvania counties-----	165.5	7.02	1,161.4	42.8	19.04	814.5	0	0	0	175.2	7.36	1,288.1	12.0	11.25	135.5	9.0	15.41	141.8	404.5	8.75	3,541.3
27. Ohio and West Virginia counties-----	66.9	8.93	597.5	2.8	22.94	63.4	0	0	0	68.7	9.00	618.8	3.9	12.48	48.2	3.0	18.37	55.1	145.3	9.52	1,383.0
28. All other destinations-----	41.2	0	0	0	0	0	0	0	0	16.8	0	0	.9	0	0	2.9	0	0	60.9	0	0
Subtotal or average-----	273.6	6.42	1,758.9	45.6	19.27	877.9	0	0	0	260.7	7.32	1,906.9	16.8	10.92	183.7	14.0	13.96	196.9	610.7	8.06	4,924.3
29. A voidable delay—outbound-----	(537.1)	.05	26.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(537.1)	.05	26.9
Total or average-----	537.1	5.56	2,985.9	135.4	13.71	1,855.2	13.5	9.68	130.5	627.3	6.08	3,815.5	60.7	8.52	517.1	29.6	11.38	335.8	1,403.6	6.82	9,640.0
Grand total or average-----	537.1	10.51	5,646.9	135.1	40.24	5,437.0	13.5	19.78	267.0	627.3	14.96	9,383.3	60.7	19.17	1,163.5	29.6	33.63	995.4	1,403.6	16.31	22,893.1

¹ Explanation of terms are given on pages preceding this table.

² Volume and total cost estimates are rounded to the nearest hundred after complete figures were extended.

³ Cost per ton is rounded to the nearest cent after dividing total costs by volume in tons.

⁴ Figures in parentheses are not added to totals.

or more wholesale firms. There are several reasons for these transfers: (1) Jobbers, purveyors, and processors usually do not stock complete lines of products within their food group, and dealers often are required to purchase products from another wholesaler to satisfy a regular customer. (2) Products used regularly in less-than-carlot quantities are ordered in carlots and split between wholesalers to minimize transportation charges. (3) Seasonal marketing conditions promote intra-market transfer.

This cost comprises labor and equipment charges for loading, transfer between locations, and unloading. Several handling operations are included in this cost to obtain a complete estimate for items handled two or more times.

Assuming the same organizational structure of firms in present and proposed facilities, the volume transferred remains the same; but the cost per ton is decreased by improved methods. In other markets, both volume and cost per ton decreased slightly to a total cost similar to the figure in the proposed facilities table.

14. Rental costs in present facilities consist of either actual rents or rental value of maintaining facilities where such structures are owned by using firms or where rentals do not reflect the value of facilities. Volume for which rentals are shown include only products that physically moved through facilities. In proposed facilities, the rental value of facilities is based on the Chartiers site with financing by a public benefit corporation.

15. Average public warehouse charges for each food group are computed using storage fees and applicable handling fees; these total charges are converted to a cost per ton. In proposed facilities, warehouse charges are reduced from present averages, because space is provided in the facilities for some of the volume presently forced into public storage by lack of the proper type of storage.

16. Demurrage is charged according to a scale for all railroads. It is a penalty for holding cars longer than 48 hours after the first 7 a.m. following the original car placement. This cost is obtained from railroads' records. Because of the lack of refrigerated facilities and use of rail car in lieu of such space, this is a high-cost item in several food groups in present facilities. In proposed facilities, demurrage could be reduced by efficient facilities with the proper type of refrigerated storage.

17. Car icing is a high-cost item in present facilities because unusually large quantities of ice

are used in place of refrigerated rooms in the facilities. This cost was obtained from firms which are engaged in selling and placing ice in rail cars.

18. Spoilage was the direct volume loss suffered due to inadequate quality maintenance temperature for fresh foods and breakage from poor handling practices. Such losses approximated 1 percent of the value per ton in present facilities and 0.5 percent of the value per ton in proposed facilities. Estimates were based on wholesalers' experience in establishing markup, information from refuse collectors, and cost accounting records from several progressive firms.

19. Contents insurance is based on fire and extended coverage, hazards, and annual tonnage per square foot. Estimates of applicable rates were obtained from wholesalers' insurance contracts. Proposed facilities would allow favorable conditions for reducing the fire hazards.

20. Switching of rail cars is associated with the problem of car icing and demurrage to obtain temporary refrigerated storage. The problem is exclusive with fresh fruits and vegetables; the most extensive use of switching to bring rail cars to a point for unloading on successive occasions is at the Pennsylvania Railroad's produce terminal. This cost was obtained from the railroads' records.

21 through 28. These items reflect the average costs of delivery from the center of distribution in Allegheny County to all retailers in areas shown. These data were obtained from the 82 firms sampled. Costs per ton were computed by using the following factors: (1) The average round-trip distance and tons per load for each area was found. (2) The average labor cost for truck-use time was found in each commodity group. Labor rates with fringe benefits ranged from \$2.68 to \$2.83 per hour per man. (3) Truck costs were computed on a per mile basis for each food group. These costs ranged from 12 cents to 23 cents per mile. The only toll charge bridges and highways in the area are part of the Pennsylvania Turnpike System. Such tolls were negligible, but they were included in the cost per mile.

For foods going outside of the distribution area, costs are considered for loading only. It is assumed that the same volume will move to the same areas from proposed facilities as from present facilities.

29. Avoidable delay to outbound delivery trucks could not be eliminated due to delivery schedule restrictions. However, most of the delay was due to the congestion described in item 2.

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